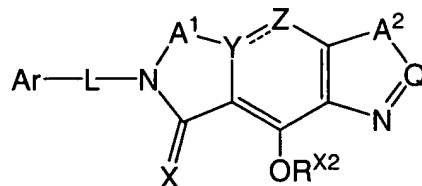


## CLAIMS

We claim:

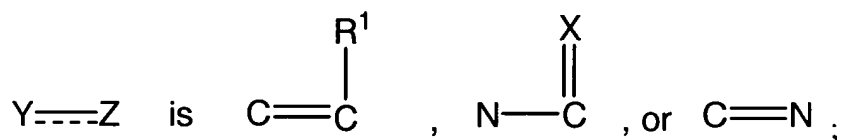
- (previously presented): A compound having the structure:



wherein:

A<sup>1</sup> and A<sup>2</sup> are independently selected from O, S, NR, C(R<sup>2</sup>)<sub>2</sub>, CR<sup>2</sup>OR, CR<sup>2</sup>OC(=O)R, C(=O), C(=S), CR<sup>2</sup>SR, C(=NR), C(R<sup>2</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=C(R<sup>3</sup>), C(R<sup>2</sup>)<sub>2</sub>-O, NR-C(R<sup>3</sup>)<sub>2</sub>, N=C(R<sup>3</sup>), N=N, SO<sub>2</sub>-NR, C(=O)C(R<sup>3</sup>)<sub>2</sub>, C(=O)NR, C(R<sup>2</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=C(R<sup>3</sup>)-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)C(=O)NR, C(R<sup>2</sup>)C(=S)NR, C(R<sup>2</sup>)=N-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=N-NR, and N=C(R<sup>3</sup>)-NR;

Q is N, <sup>+</sup>NR, or CR<sup>4</sup>;



L is selected from a bond, O, S, S-S, S(=O), S(=O)<sub>2</sub>, S(=O)<sub>2</sub>NR, NR, N-OR, C<sub>1</sub>-C<sub>12</sub> alkylene, C<sub>1</sub>-C<sub>12</sub> substituted alkylene, C<sub>2</sub>-C<sub>12</sub> alkenylene, C<sub>2</sub>-C<sub>12</sub> substituted alkenylene, C<sub>2</sub>-C<sub>12</sub> alkynylene, C<sub>2</sub>-C<sub>12</sub> substituted alkynylene, C(=O)NH, OC(=O)NH, NHC(=O)NH, C(=O), C(=O)NH(CH<sub>2</sub>)<sub>n</sub>, or (CH<sub>2</sub>CH<sub>2</sub>O)<sub>n</sub>, where n may be 1, 2, 3, 4, 5, or 6;

X is selected from O, S, NH, NR, N-OR, N-NR<sub>2</sub>, N-CR<sub>2</sub>OR and N-CR<sub>2</sub>NR<sub>2</sub>;

Ar is selected from C<sub>3</sub>-C<sub>12</sub> carbocycle, C<sub>3</sub>-C<sub>12</sub> substituted carbocycle, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>6</sub>-C<sub>20</sub> substituted aryl, C<sub>2</sub>-C<sub>20</sub> heteroaryl, and C<sub>2</sub>-C<sub>20</sub> substituted heteroaryl;

$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  are each independently selected from H, F, Cl, Br, I, OH,  $-NH_2$ ,  $-NH_3^+$ ,  $-NHR$ ,  $-NR_2$ ,  $-NR_3^+$ ,  $C_1-C_8$  alkylhalide, carboxylate, sulfate, sulfamate, sulfonate, 5-7 membered ring sultam,  $C_1-C_8$  alkylsulfonate,  $C_1-C_8$  alkylamino, 4-dialkylaminopyridinium,  $C_1-C_8$  alkylhydroxyl,  $C_1-C_8$  alkylthiol,  $-SO_2R$ ,  $-SO_2Ar$ ,  $-SOAr$ ,  $-SAr$ ,  $-SO_2NR_2$ ,  $-SOR$ ,  $-CO_2R$ ,  $-C(=O)NR_2$ , 5-7 membered ring lactam, 5-7 membered ring lactone,  $-CN$ ,  $-N_3$ ,  $-NO_2$ ,  $C_1-C_8$  alkoxy,  $C_1-C_8$  trifluoroalkyl,  $C_1-C_8$  alkyl,  $C_1-C_8$  substituted alkyl,  $C_3-C_{12}$  carbocycle,  $C_3-C_{12}$  substituted carbocycle,  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl, and  $C_2-C_{20}$  substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety;

when taken together on a single carbon, two  $R^2$  or two  $R^3$  may form a spiro ring;  
and

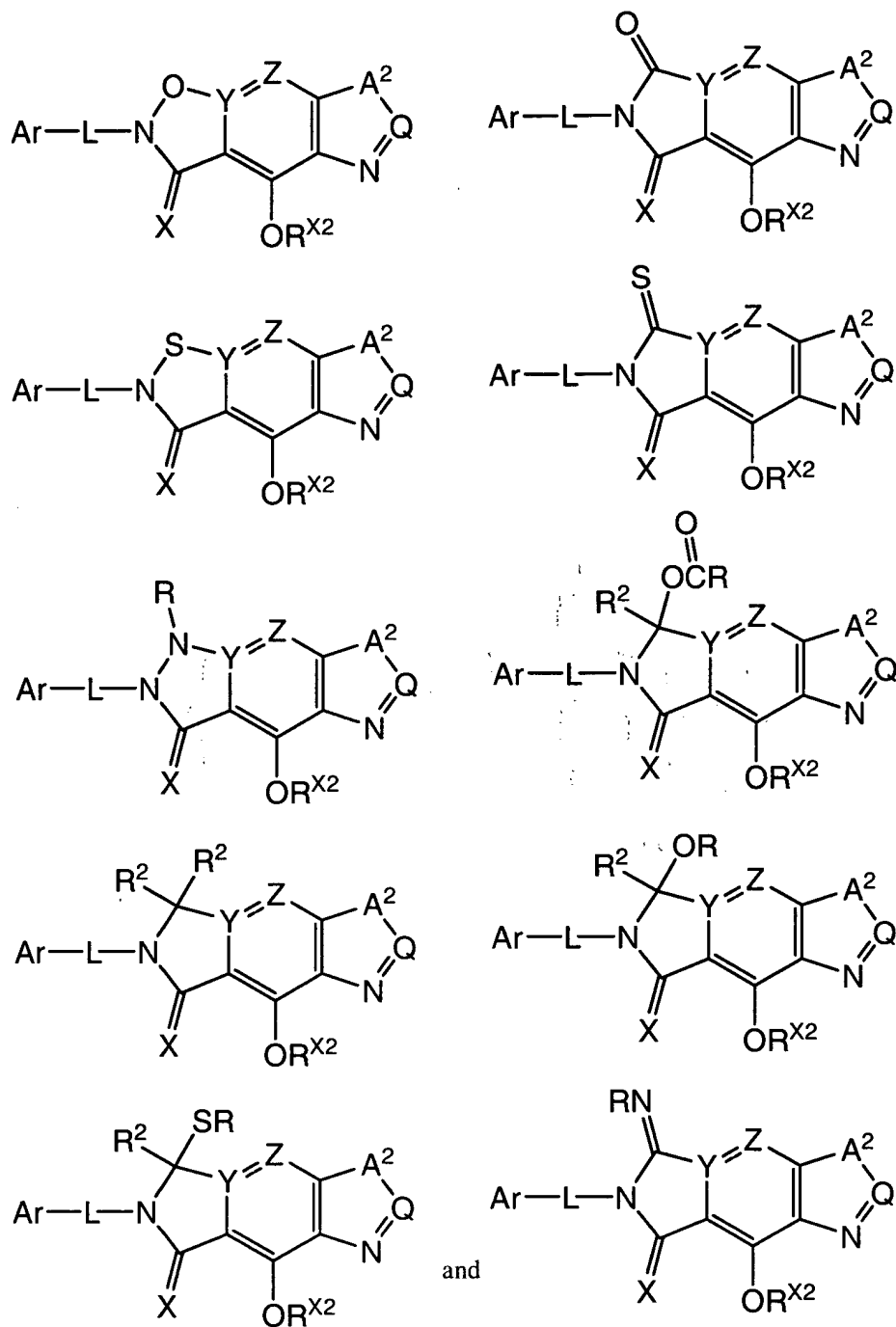
$R$  is independently selected from H,  $C_1-C_8$  alkyl,  $C_1-C_8$  substituted alkyl,  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl, and  $C_2-C_{20}$  substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety;

$R^{X2}$  is independently selected from H,  $C_1-C_8$  alkyl,  $C_1-C_8$  substituted alkyl,  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl, and  $C_2-C_{20}$  substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, a prodrug, a pharmaceutically acceptable prodrug, a prodrug moiety, a protecting group, and a phosphonate prodrug moiety;

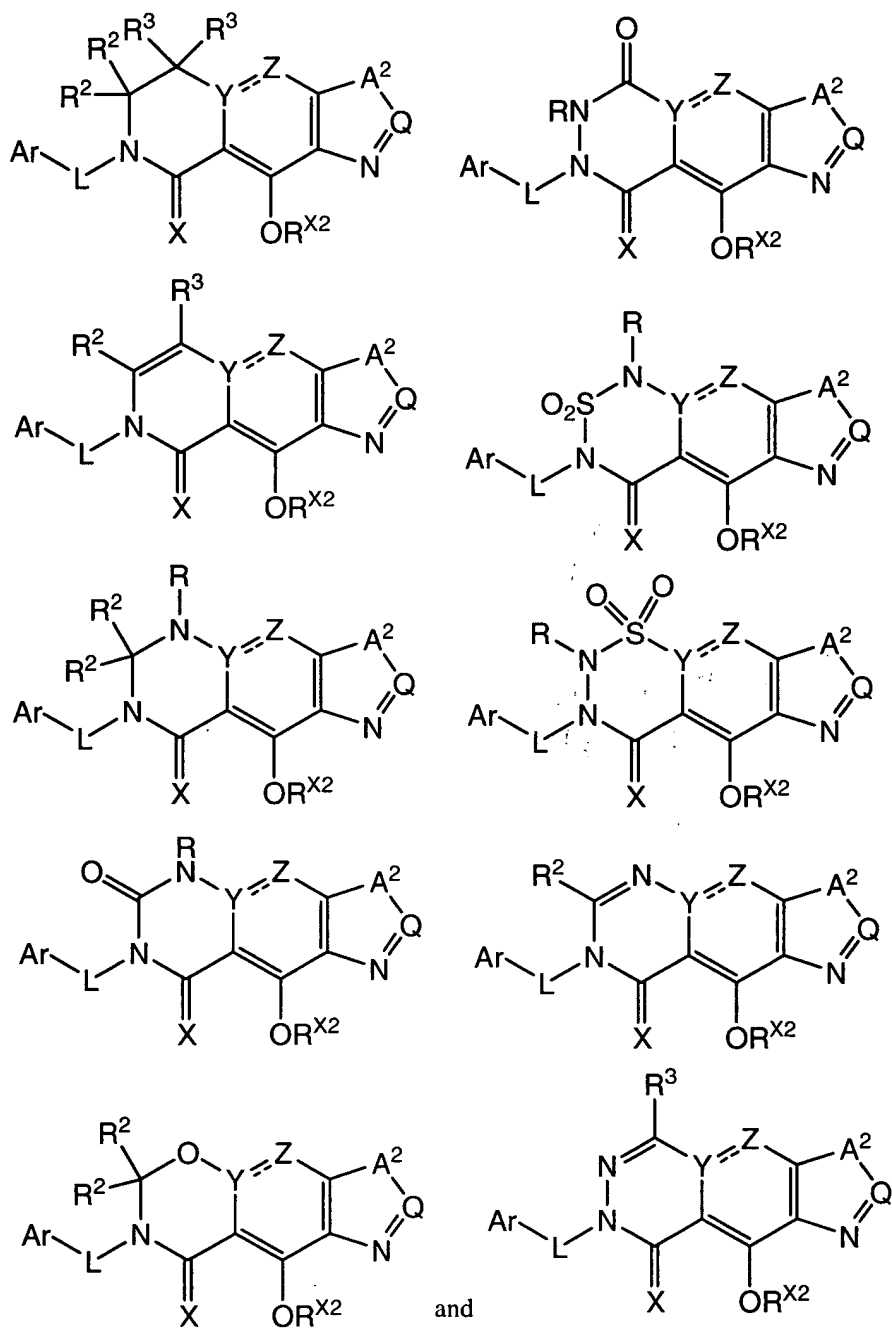
and the salts, solvates, resolved enantiomers and purified diastereomers thereof;

with the proviso that when  $Y=Z$  is  $C=C(OH)$ ,  $X$  is O,  $A^1$  is  $C(=O)$ ,  $A^2$  is  $C(R^2)=C(R^3)$ , and  $Q$  is CH, then  $L$  is not a bond.

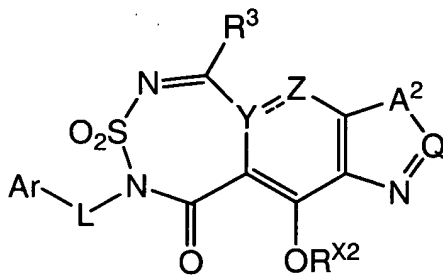
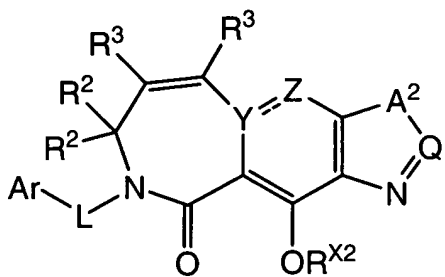
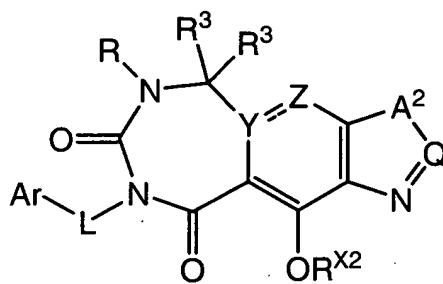
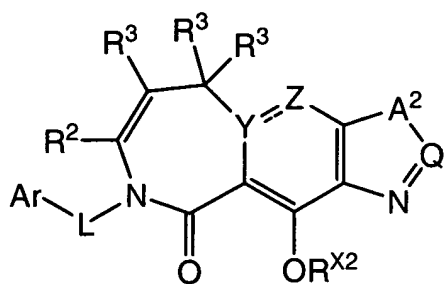
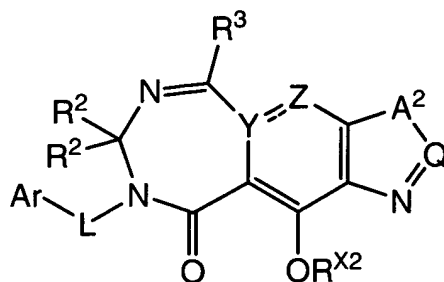
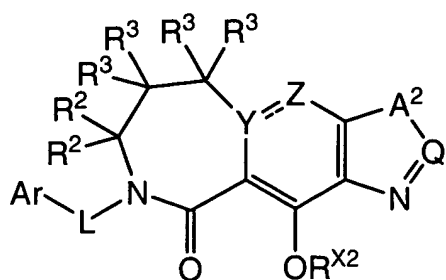
2. (previously presented): A compound of claim 1 selected from the structures:



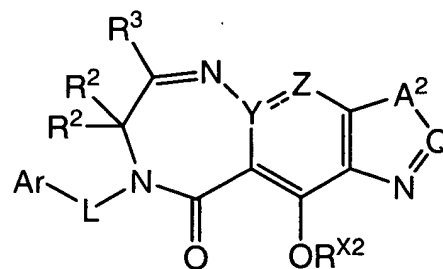
3. (previously presented): A compound of claim 1 selected from the structures:



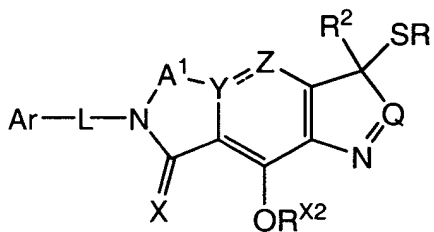
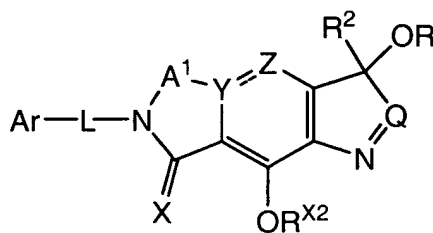
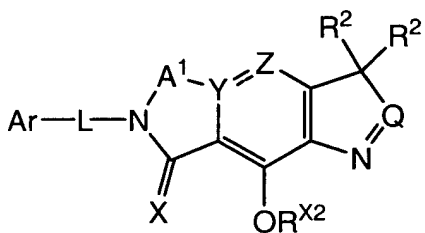
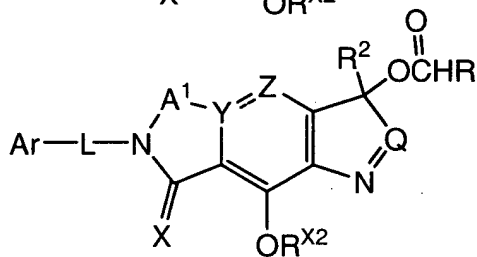
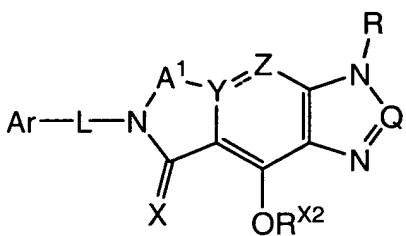
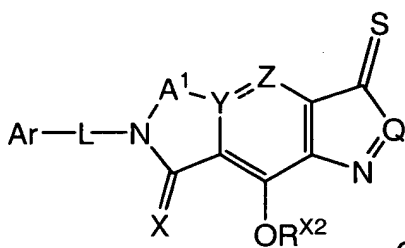
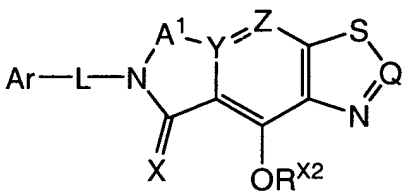
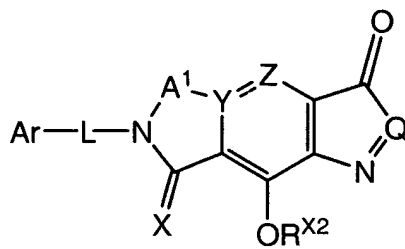
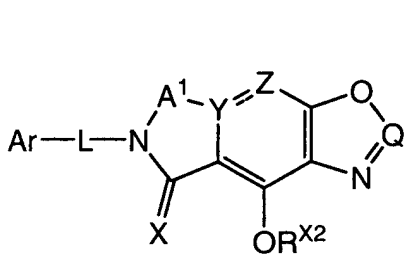
4. (previously presented): A compound of claim 1 selected from the structures:



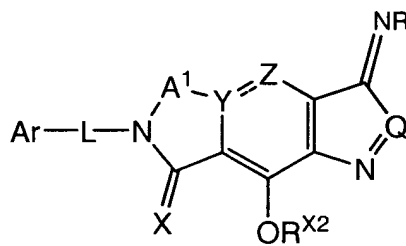
and



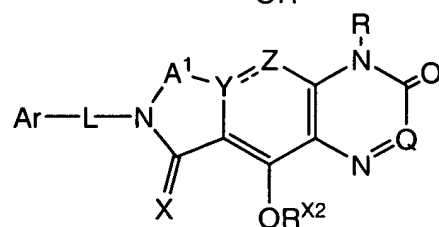
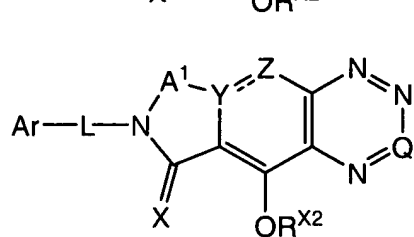
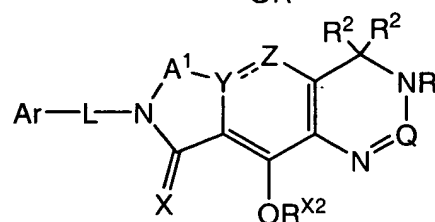
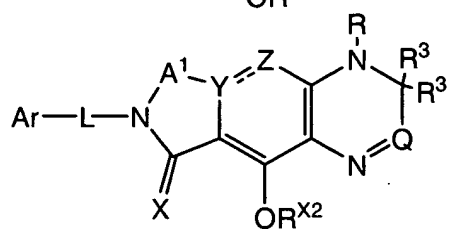
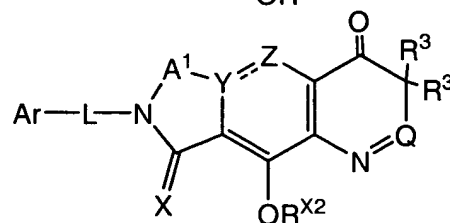
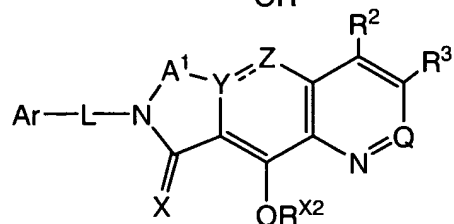
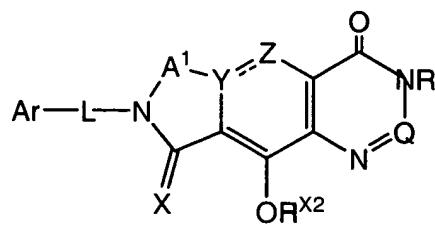
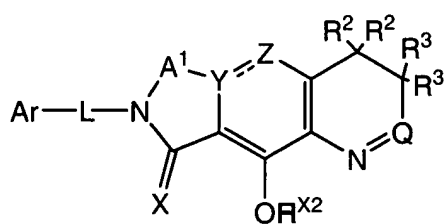
5. (previously presented): A compound of claim 1 selected from the structures:



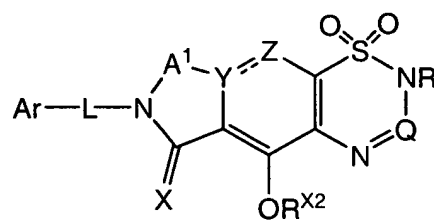
and



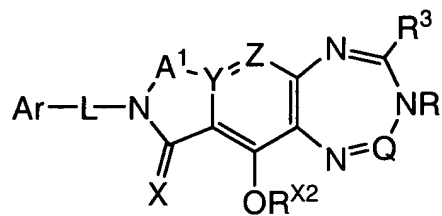
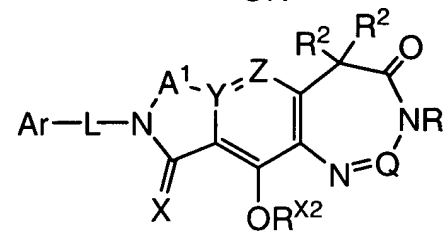
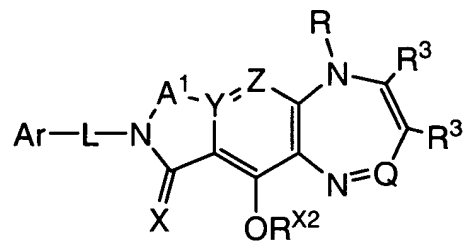
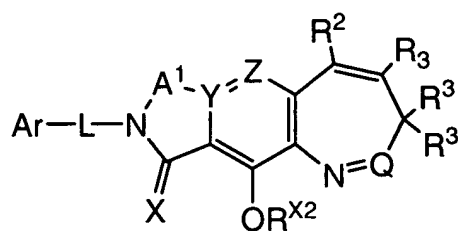
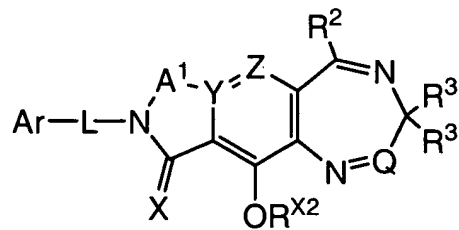
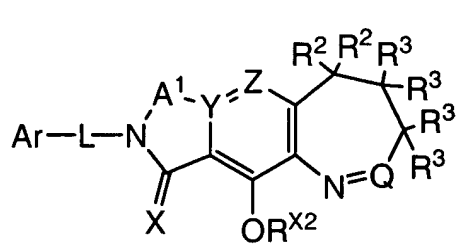
6. (previously presented): A compound of claim 1 selected from the structures:



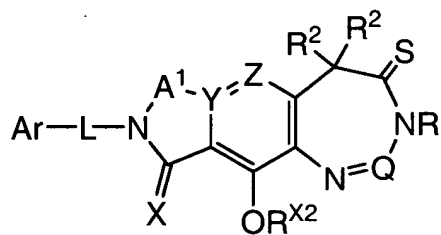
and



7. (previously presented): A compound of claim 1 selected from the structures:

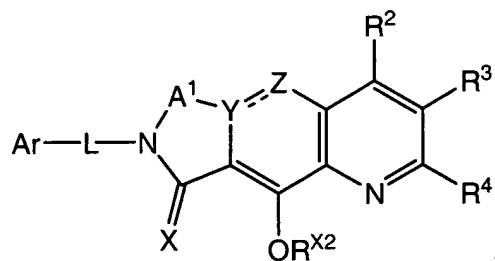


and

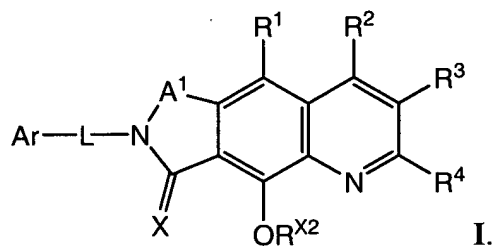




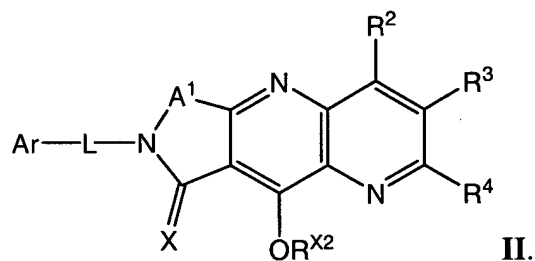
8. (previously presented): A compound of claim 6 having the structure:



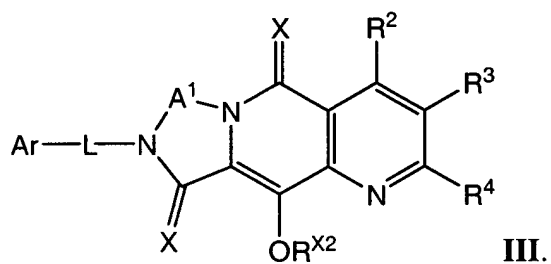
9. (previously presented): A compound of claim 6 having Formula I:



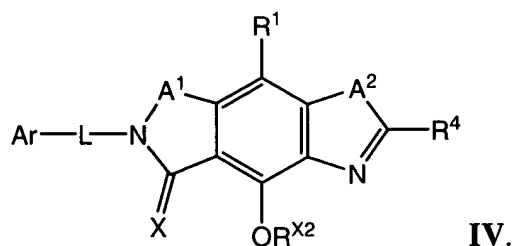
10. (previously presented): A compound of claim 6 having Formula II:



11. (previously presented): A compound of claim 6 having Formula III:



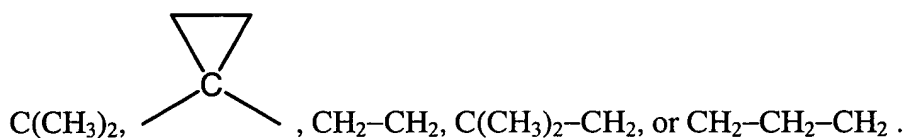
12. (previously presented): A compound of claim 1 having Formula IV:



13. (previously presented): A compound of claim 1 comprising at least one phosphonate group.

14. (previously presented): A compound of claim 1 wherein substituted alkyl, substituted alkylene, substituted alkyenylene, substituted alkynylene, substituted carbocycle, substituted aryl, and substituted heteroaryl are independently substituted with one or more substituents selected from F, Cl, Br, I, OH,  $\text{-NH}_2$ ,  $\text{-NH}_3^+$ ,  $\text{-NHR}$ ,  $\text{-NR}_2$ ,  $\text{-NR}_3^+$ ,  $\text{C}_1\text{-C}_8$  alkylhalide, carboxylate, sulfate, sulfamate, sulfonate, 5-7 membered ring sultam,  $\text{C}_1\text{-C}_8$  alkylsulfonate,  $\text{C}_1\text{-C}_8$  alkylamino, 4-dialkylaminopyridinium,  $\text{C}_1\text{-C}_8$  alkylhydroxyl,  $\text{C}_1\text{-C}_8$  alkylthiol,  $\text{-SO}_2\text{R}$ ,  $\text{-SO}_2\text{Ar}$ ,  $\text{-SOAr}$ ,  $\text{-SAr}$ ,  $\text{-SO}_2\text{NR}_2$ ,  $\text{-SOR}$ ,  $\text{-CO}_2\text{R}$ ,  $\text{-C(=O)NR}_2$ , 5-7 membered ring lactam, 5-7 membered ring lactone,  $\text{-CN}$ ,  $\text{-N}_3$ ,  $\text{-NO}_2$ ,  $\text{C}_1\text{-C}_8$  alkoxy,  $\text{C}_1\text{-C}_8$  trifluoroalkyl,  $\text{C}_1\text{-C}_8$  alkyl,  $\text{C}_3\text{-C}_{12}$  carbocycle,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_2\text{-C}_{20}$  heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety.

15. (previously presented): The compound of claim 1 wherein  $\text{A}^1$  is  $\text{CH}_2$ ,



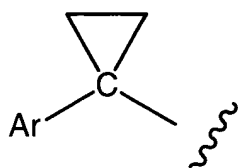
16. (previously presented): The compound of claim 9 wherein X is O; L is  $\text{CH}_2$ ; and Ar is substituted phenyl.

17. (previously presented): The compound of claim 16 wherein Ar is 4-fluorophenyl.

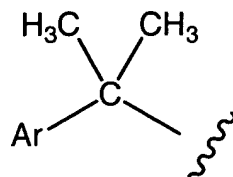
18. (previously presented): The compound of claim 9 wherein X is O; and  $\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^4$  are each H.

19. (previously presented): The compound of claim 9 wherein X is O; A<sup>1</sup> is CH<sub>2</sub>; and R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are each H.

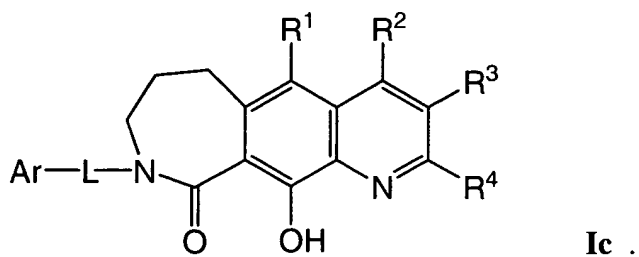
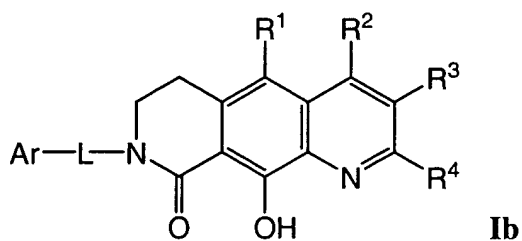
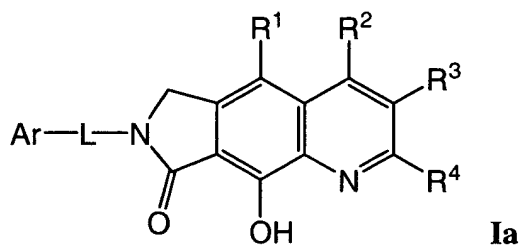
20. (previously presented): The compound of claim 1 wherein Ar-L is selected from the structures:



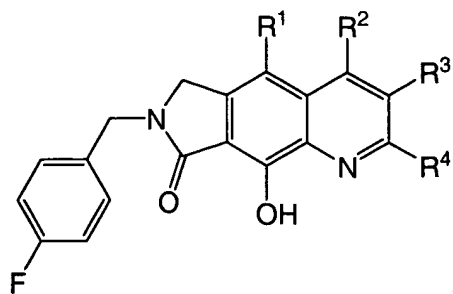
and



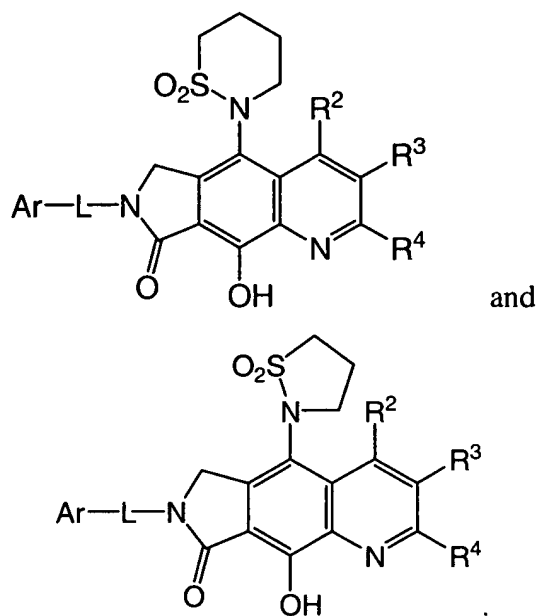
21. (previously presented): A compound of claim 9 comprising Formula Ia, Ib, or Ic:



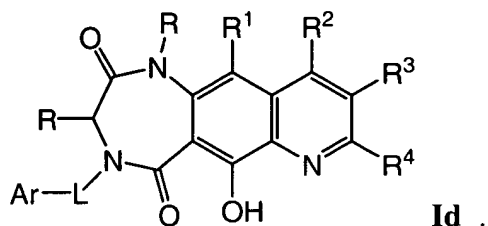
22. (previously presented): A compound of claim 9 having the structure:



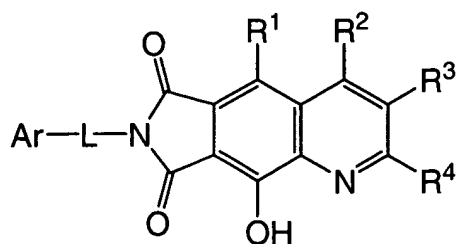
23. (previously presented): A compound of claim 22 selected from the structures:



24. (previously presented): A compound of claim 9 having Formula Id:

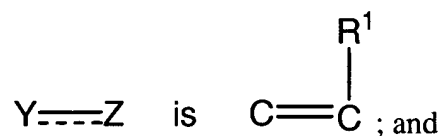


25. (previously presented): A compound of claim 9 having the structure:



with the proviso that when  $R^1$  is OH, and  $R^2$ ,  $R^3$ , and  $R^4$  are H, then L is not a bond.

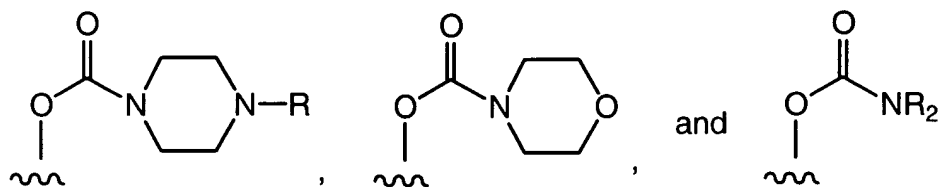
26. (previously presented): A compound of claim 1 wherein



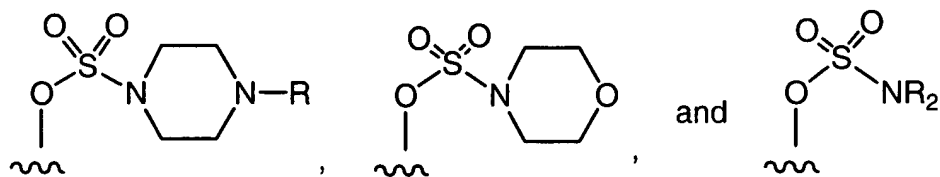
$R^1$  is  $CR_3$ ,  $C(=O)NR_2$ ,  $OC(=O)OR$ ,  $OC(=O)NR_2$ ,  $OC(=O)R$ ,  $OSO_2NR_2$  (sulfamate),  $NR_2$ ,  $NRSO_2R$ ,  $SR$ ,  $S(O)R$ ,  $SO_2R$  or  $SO_2NR_2$  (sulfonamide).

27. (previously presented): The compound of claim 26 wherein at least one R comprises a prodrug moiety.

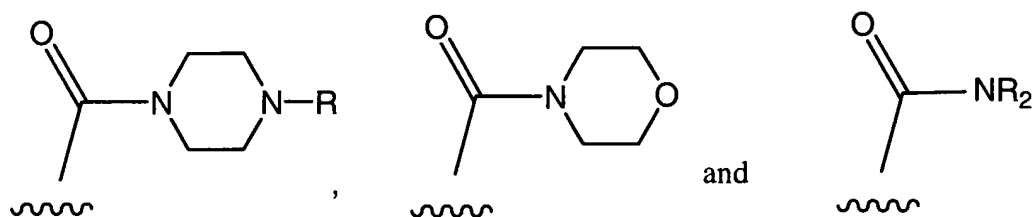
28. (previously presented): A compound of claim 1 wherein at least one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  is selected from the structures:



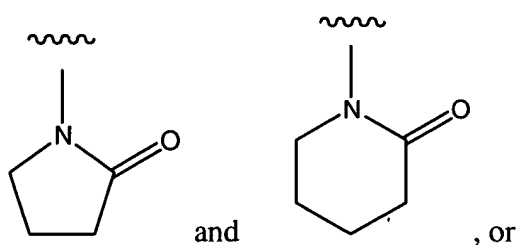
29. (previously presented): A compound of claim 1 wherein at least one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  is selected from the structures:



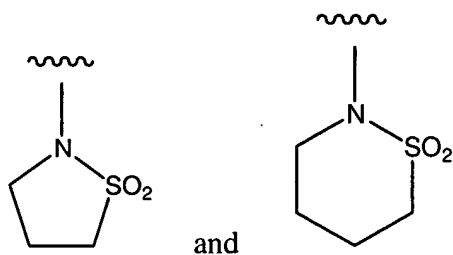
30. (previously presented): A compound of claim 1 wherein at least one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  is selected from the structures:



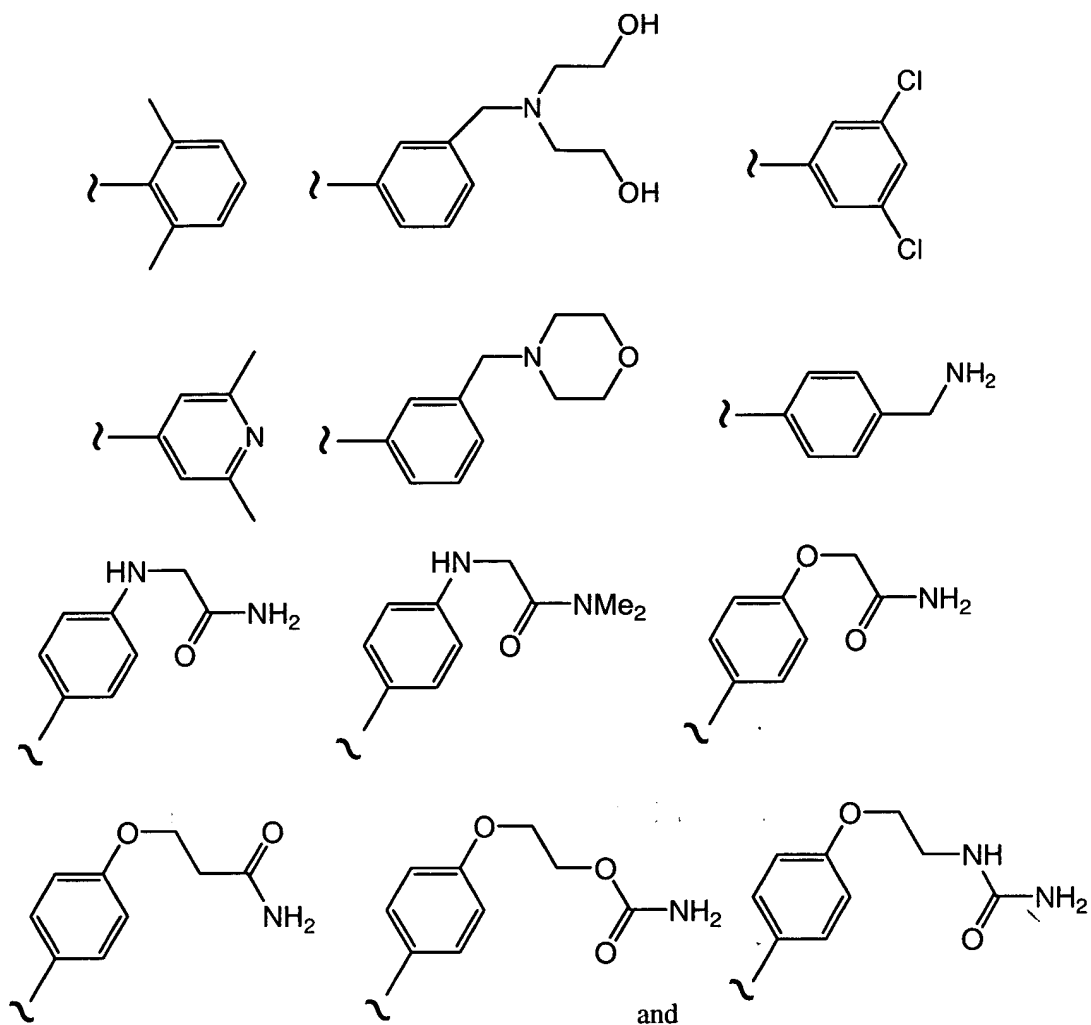
31. (previously presented): A compound of claim 1 wherein at least one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  comprise a lactam having the structures:




a sultam having the structures:

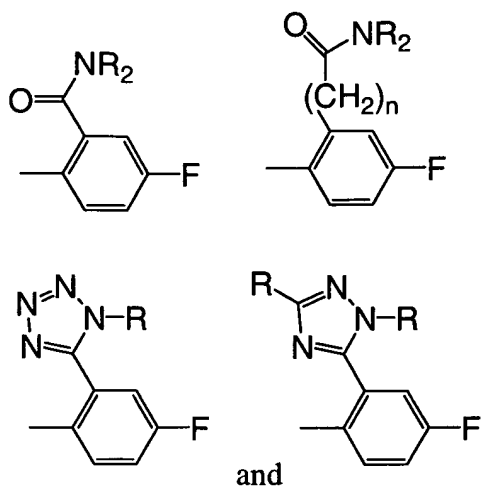


32. (previously presented): A compound of claim 1 wherein Ar is selected from the structures:



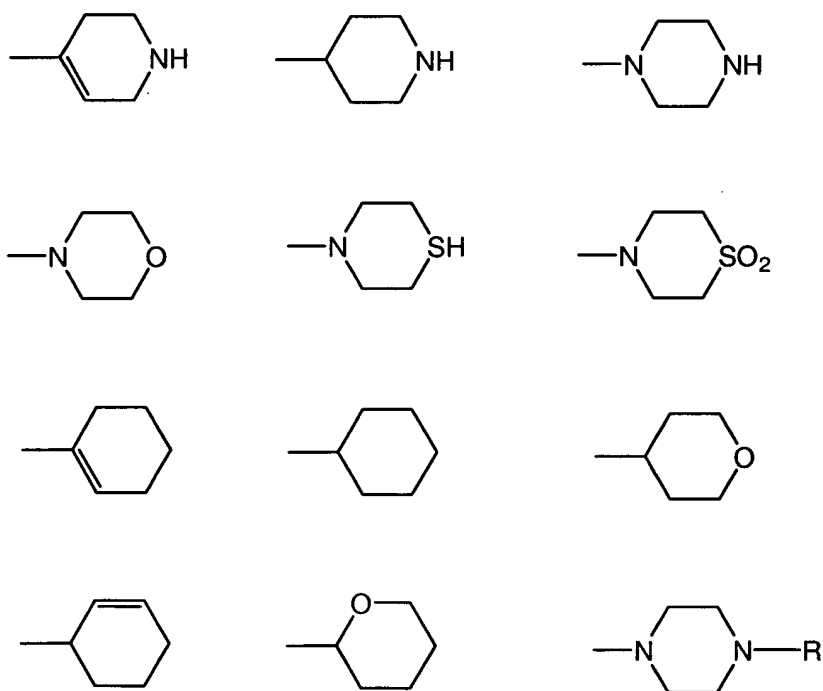
where the wavy line  indicates the covalent attachment site to L.

33. (previously presented): A compound of claim 1 wherein Ar is selected from the structures:

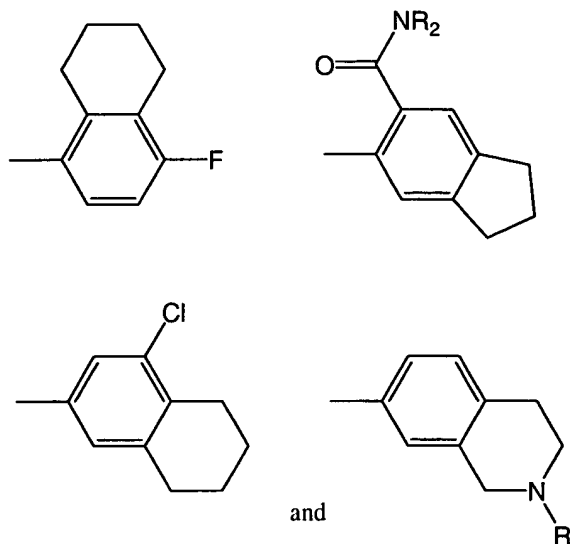


where n is 1 to 6.

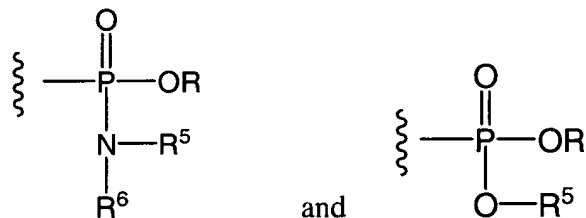
34. (previously presented): A compound of claim 1 wherein Ar is selected from the structures:





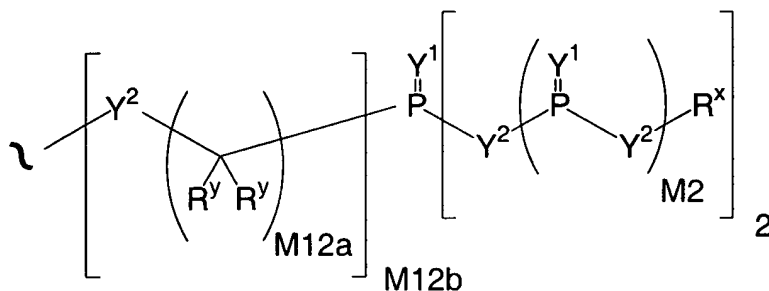


35. (previously presented): A compound of claim 1 comprising a prodrug moiety selected from the structures:



wherein  $R^5$  is  $-\text{CR}_2\text{CO}_2R^7$  where  $R^6$  and  $R^7$  are independently H or  $\text{C}_1\text{--C}_8$  alkyl.

36. (previously presented): The compound of claim 1 comprising a phosphonate or prodrug moiety having the structure:



wherein:

$Y^1$  is independently O, S,  $\text{N}(\text{R}^x)$ ,  $\text{N}(\text{O})(\text{R}^x)$ ,  $\text{N}(\text{OR}^x)$ ,  $\text{N}(\text{O})(\text{OR}^x)$ , or  $\text{N}(\text{N}(\text{R}^x)_2)$ ;

$Y^2$  is independently a bond, O,  $\text{N}(\text{R}^x)$ ,  $\text{N}(\text{O})(\text{R}^x)$ ,  $\text{N}(\text{OR}^x)$ ,  $\text{N}(\text{O})(\text{OR}^x)$ ,  $\text{N}(\text{N}(\text{R}^x)_2)$ ,  $-\text{S}(\text{O})-$  (sulfoxide),  $-\text{S}(\text{O})_2-$  (sulfone),  $-\text{S}-$  (sulfide), or  $-\text{S}-\text{S}-$  (disulfide);

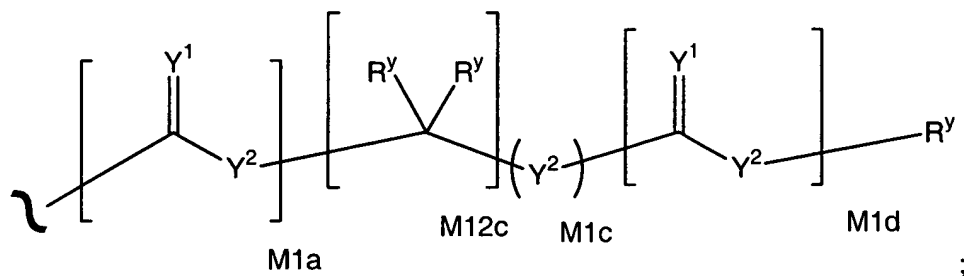
M2 is 0, 1 or 2;

M12a is 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12;

M12b is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12;

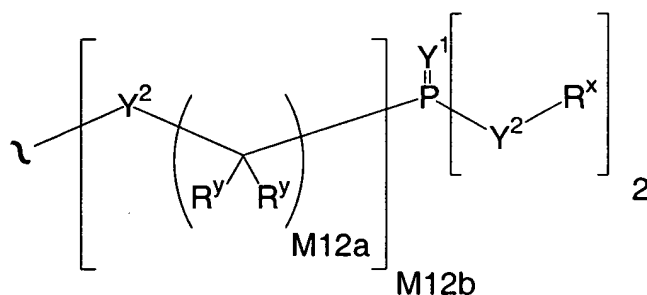
$R^y$  is independently H,  $C_1$ – $C_6$  alkyl,  $C_1$ – $C_6$  substituted alkyl,  $C_6$ – $C_{20}$  aryl,  $C_6$ – $C_{20}$  substituted aryl, or a protecting group, or where taken together at a carbon atom, two vicinal  $R^y$  groups form a carbocycle or a heterocycle; and

$R^x$  is independently H,  $C_1$ – $C_6$  alkyl,  $C_1$ – $C_6$  substituted alkyl,  $C_6$ – $C_{20}$  aryl,  $C_6$ – $C_{20}$  substituted aryl, or a protecting group, or the formula:

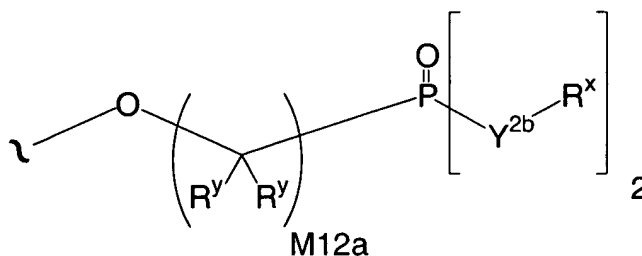


where M1a, M1c, and M1d are independently 0 or 1, and M12c is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

37. (previously presented): The compound of claim 36 wherein the phosphonate or prodrug moiety has the structure:

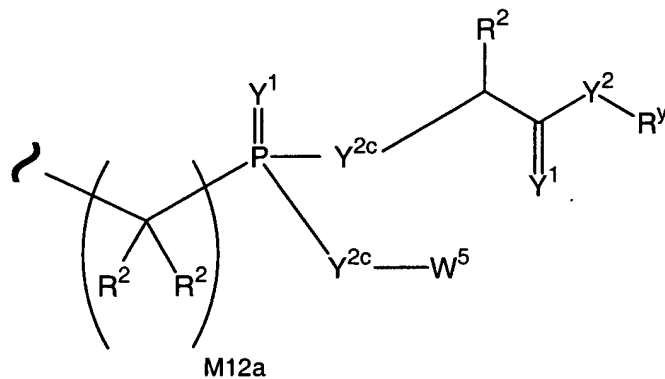


38. (previously presented): The compound of claim 37 wherein the phosphonate or prodrug moiety has the structure:



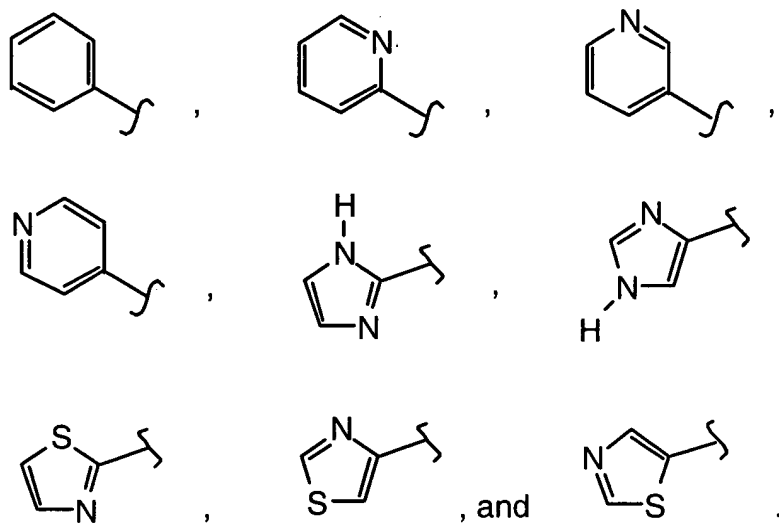
where  $Y^{2b}$  is O or N( $R^x$ ).

39. (previously presented): The compound of claim 37 wherein the phosphonate or prodrug moiety has the structure:

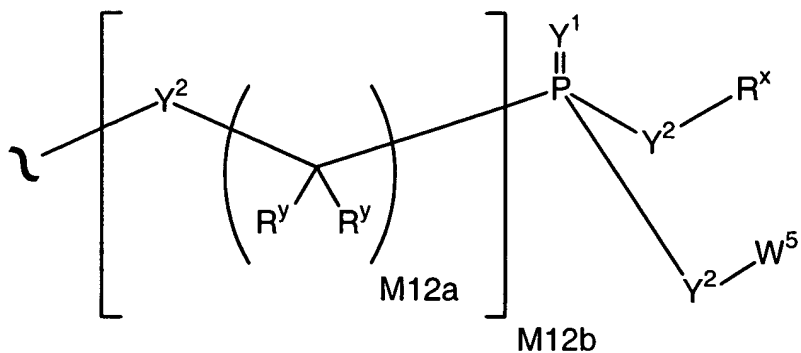


where  $W^5$  is a carbocycle, and  $Y^{2c}$  is O, N( $R^y$ ) or S.

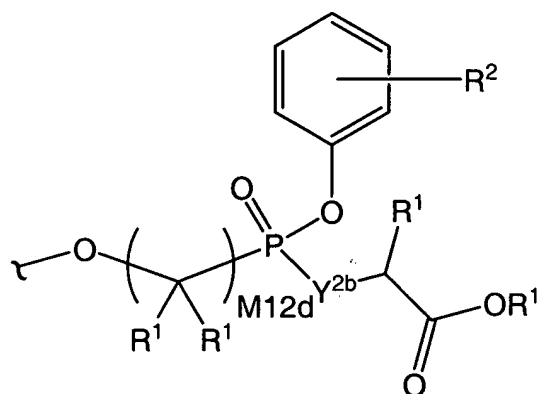
40. (previously presented): The compound of claim 39 wherein  $W^5$  is selected from the structures:



41. (previously presented): The compound of claim 37 wherein the phosphonate or prodrug moiety has the structure:

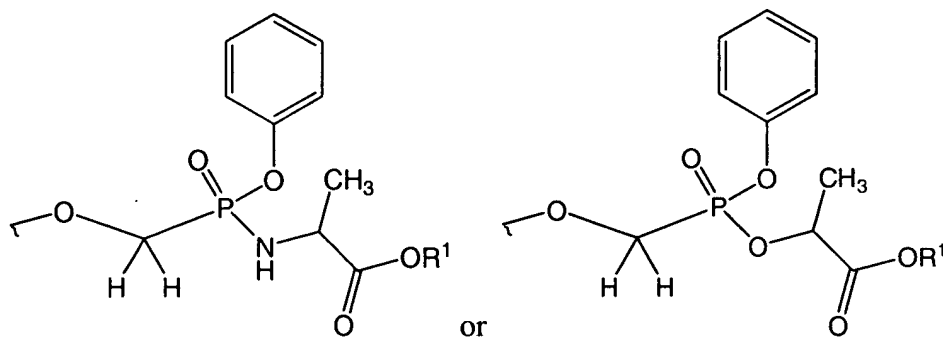


42. (previously presented): The compound of claim 41 wherein the phosphonate or prodrug moiety has the structure:

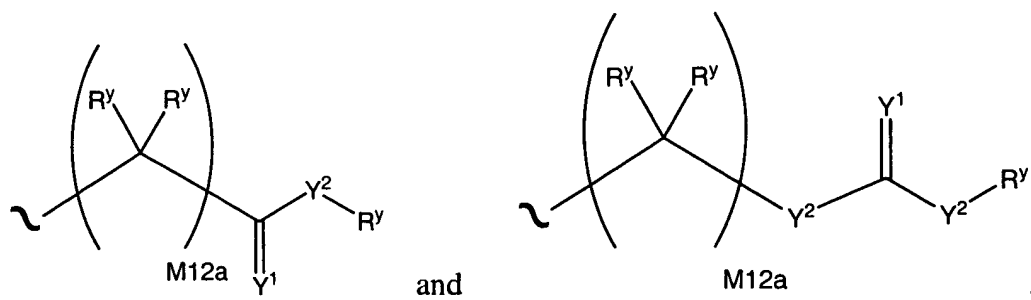


wherein  $Y^{2b}$  is O or  $N(R^x)$ ; M12d is 1, 2, 3, 4, 5, 6, 7 or 8;  $R^1$  is H or  $C_1-C_6$  alkyl; and the phenyl carbocycle is substituted with 0 to 3  $R^2$  groups where  $R^2$  is  $C_1-C_6$  alkyl or substituted alkyl.

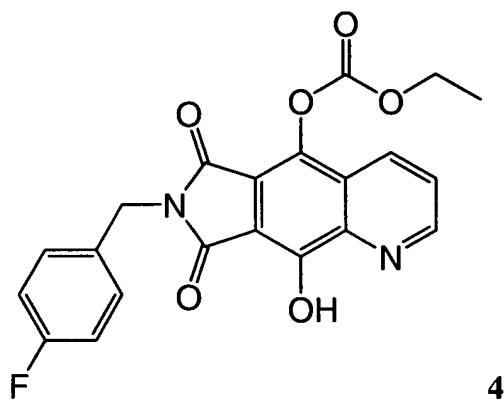
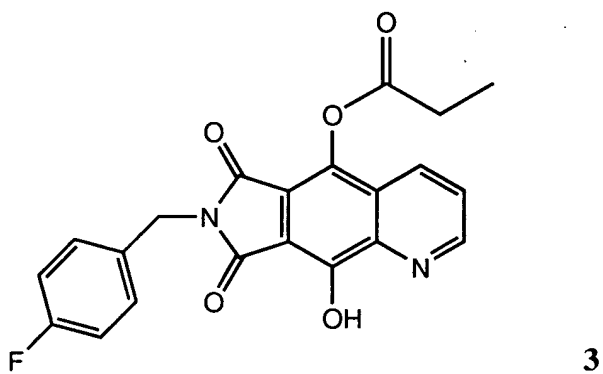
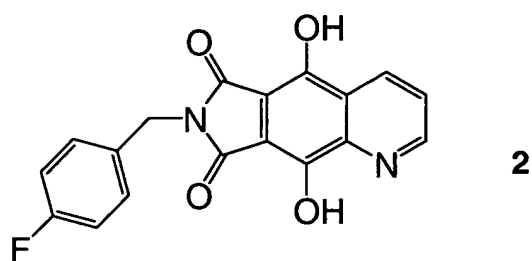
43. (previously presented): The compound of claim 42 wherein the phosphonate or prodrug moiety has the structure:

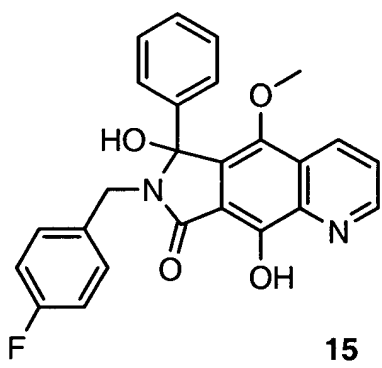
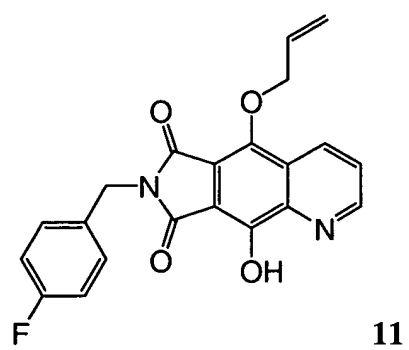
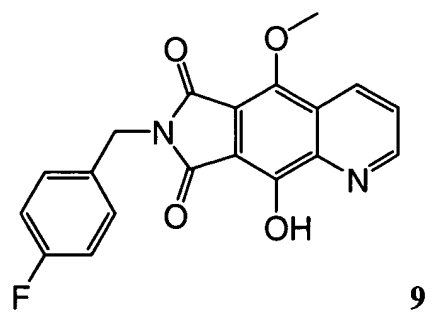


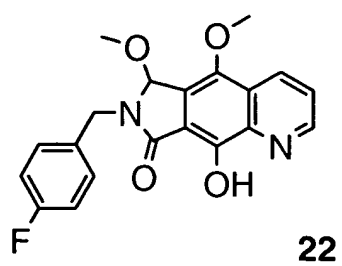
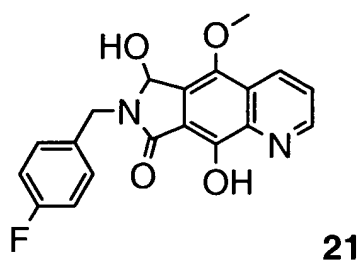
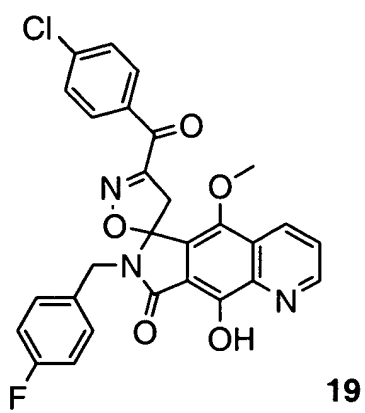
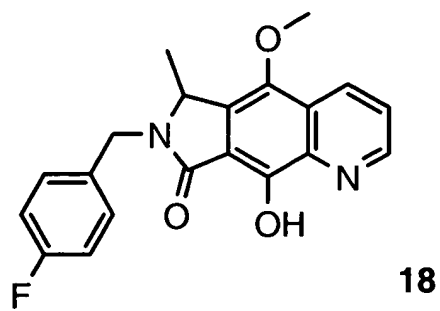
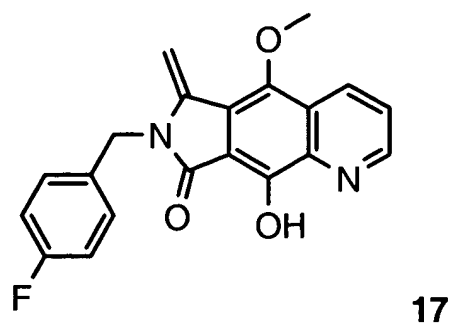
44. (previously presented): The compound of claim 36 wherein  $R^x$  is selected from the structures:

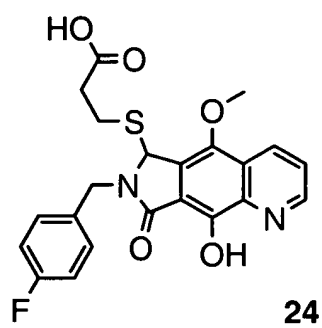
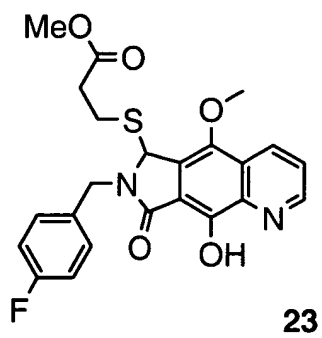


45. (previously presented): A compound of claim 9 selected from the structures:

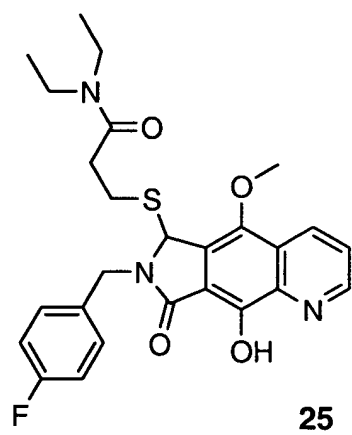






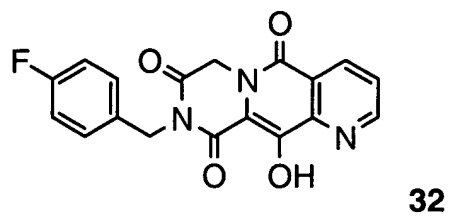


and

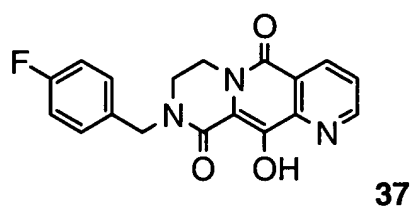




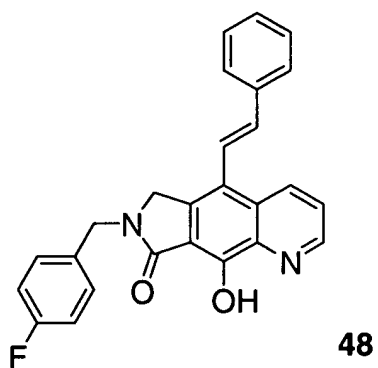
46. (previously presented): A compound of claim 11 selected from the structures:

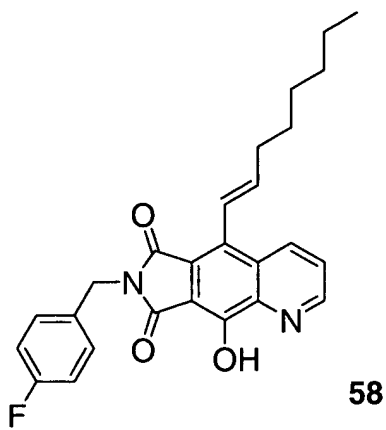
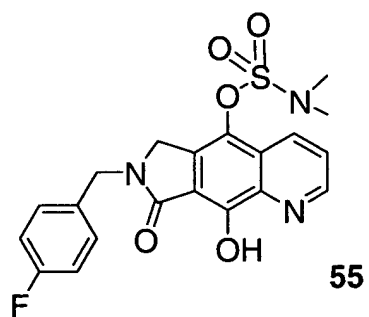
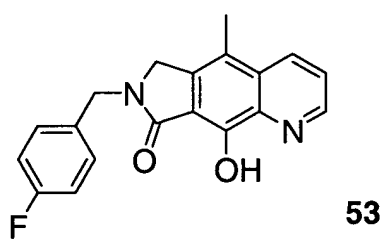
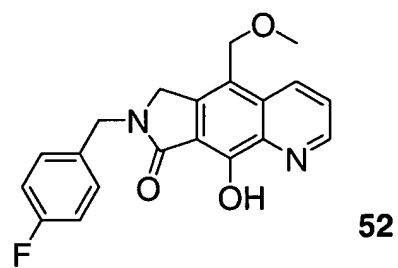
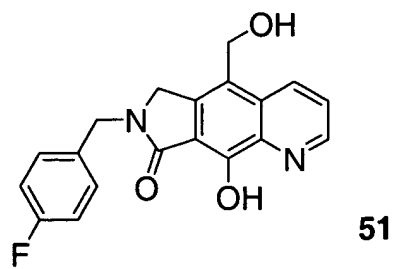


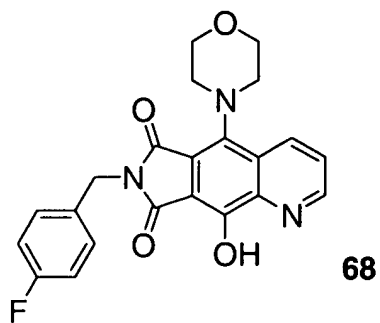
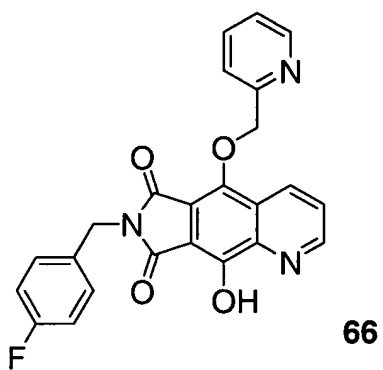
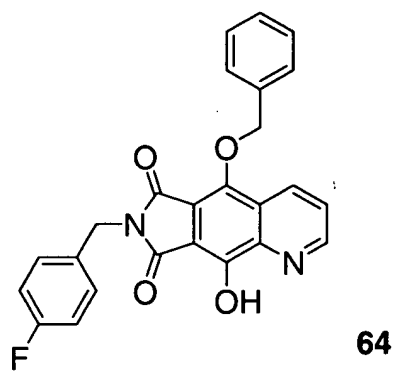
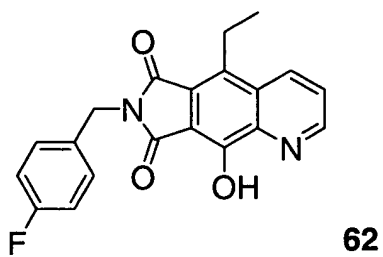
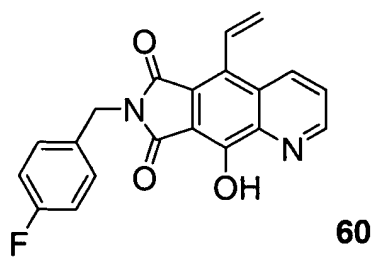
and

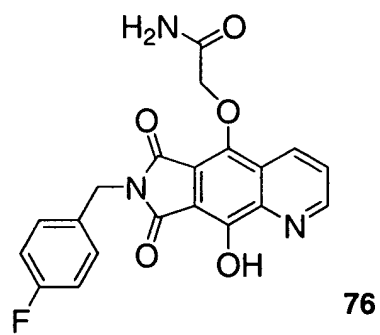
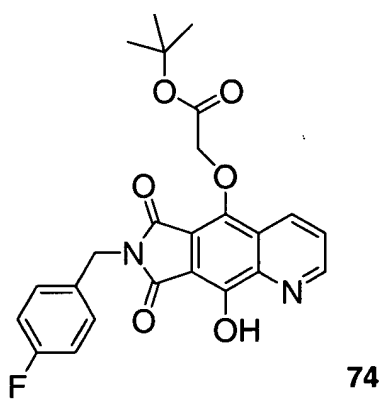
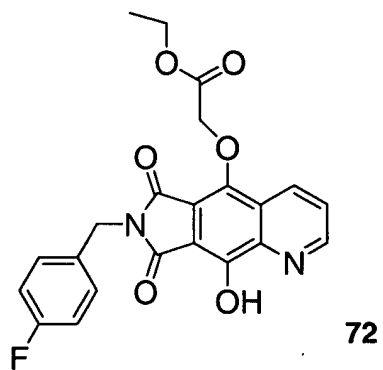
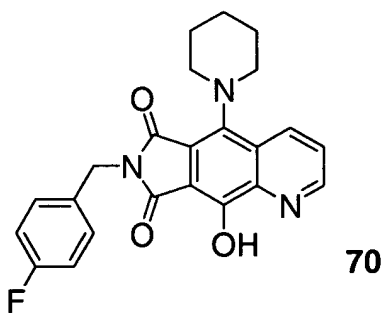


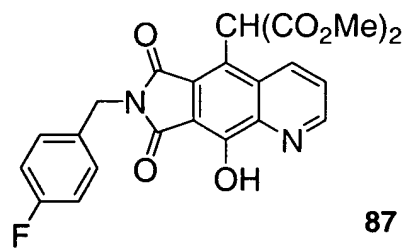
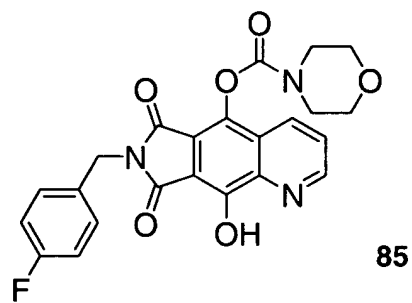
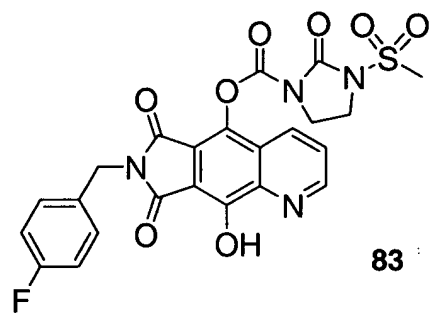
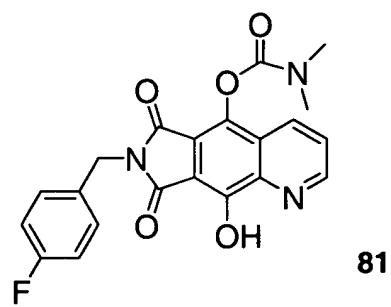
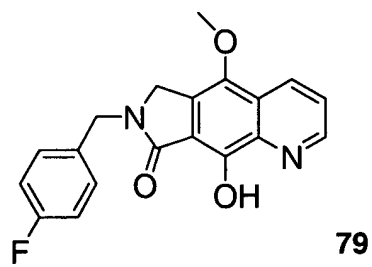
47. (previously presented): A compound of claim 9 selected from the structures:

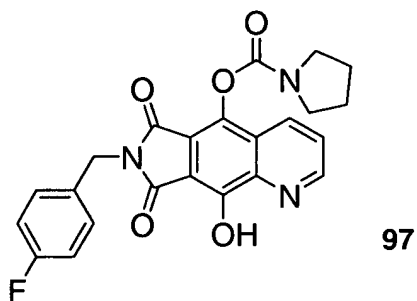
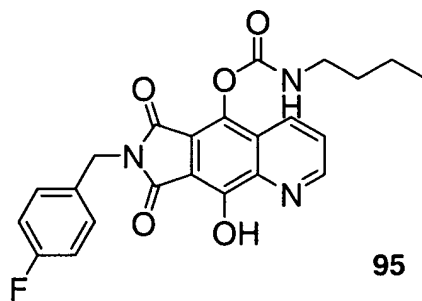
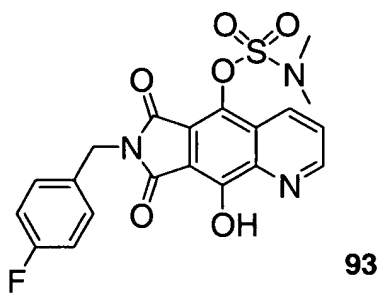
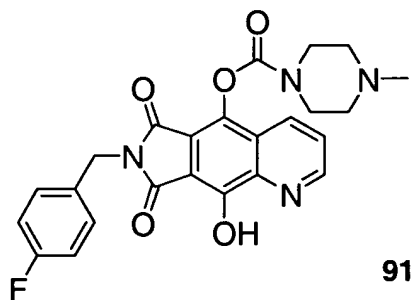
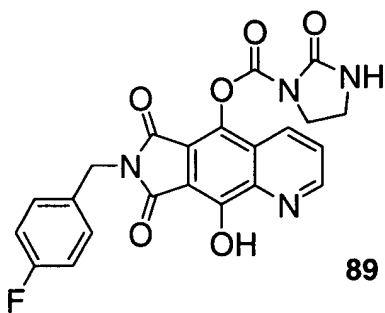


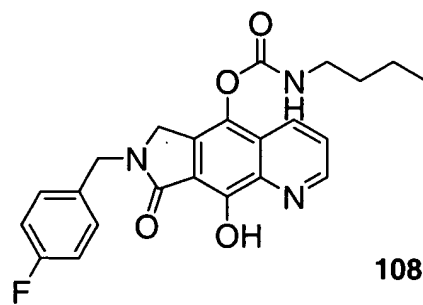
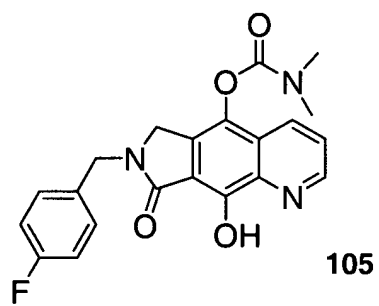
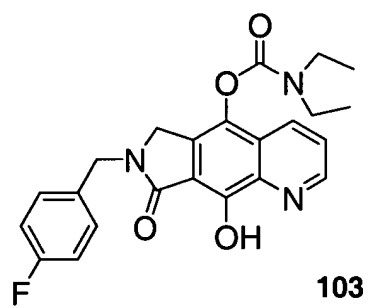
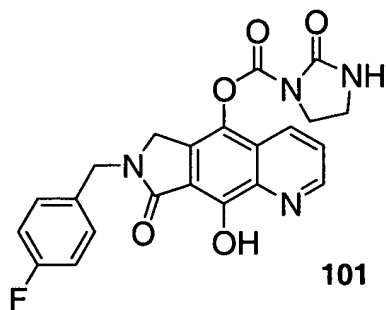
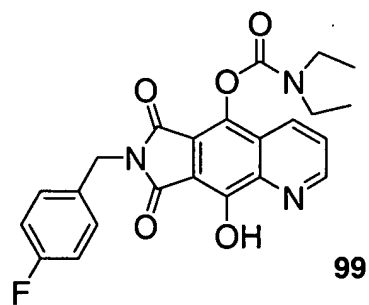


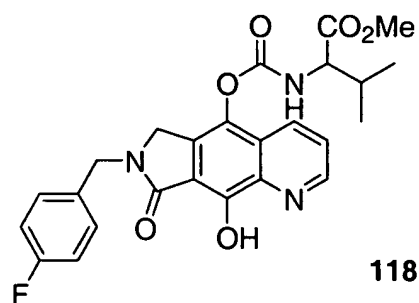
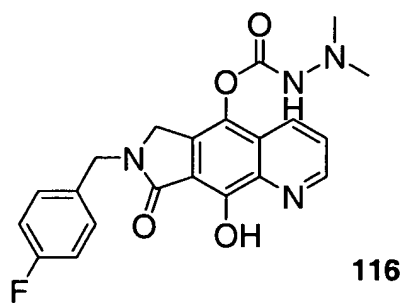
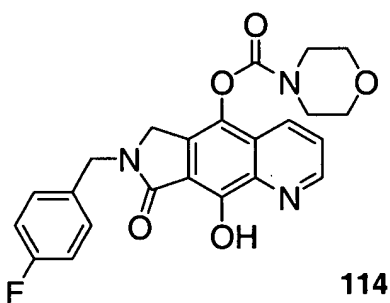
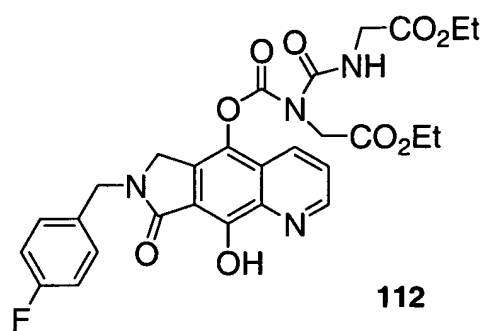
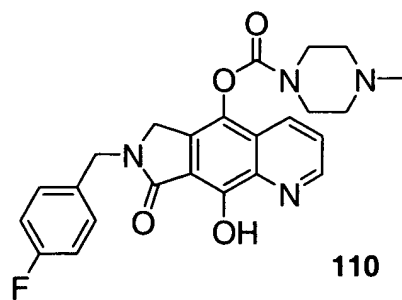




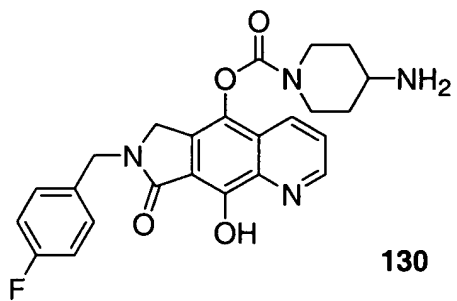
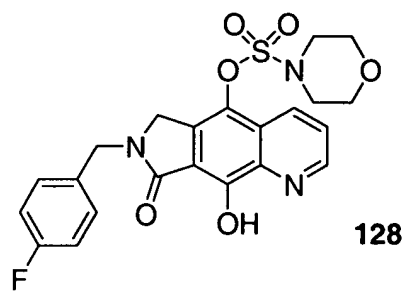
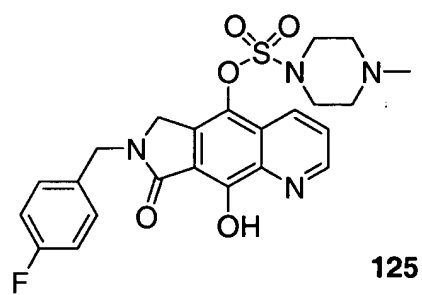
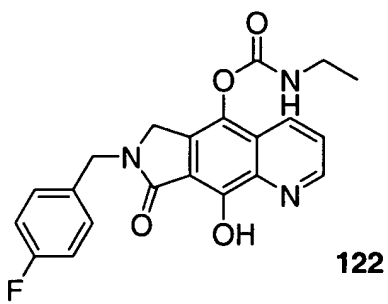
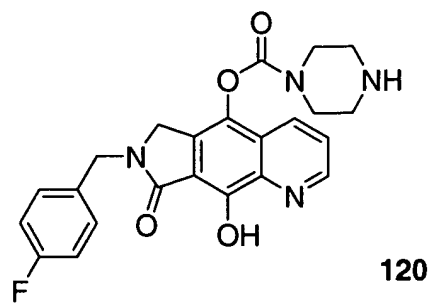


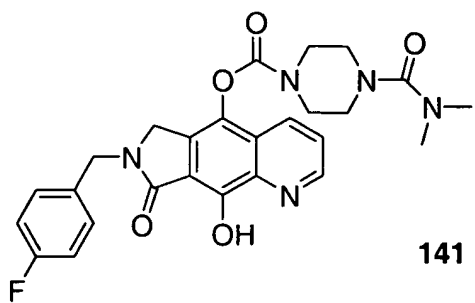
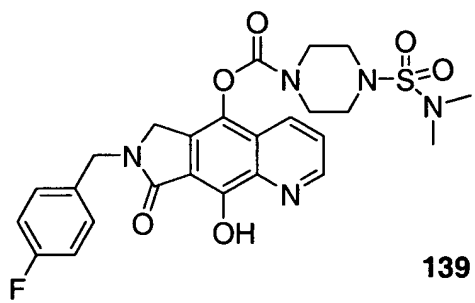
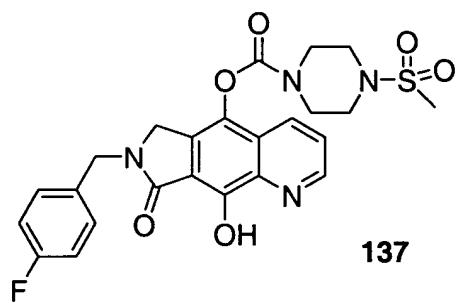
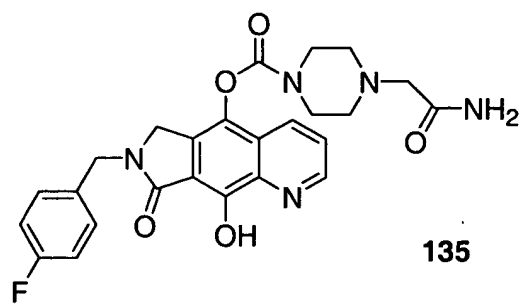
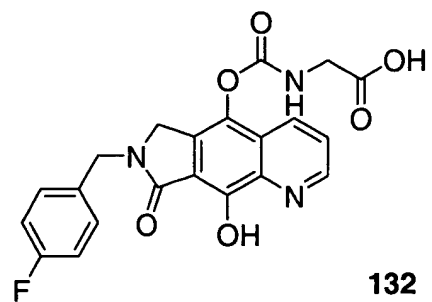


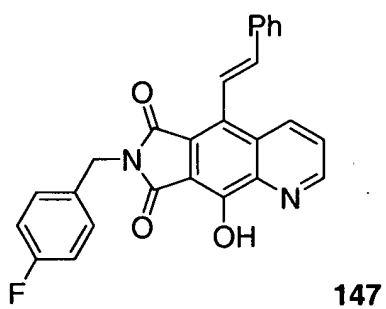
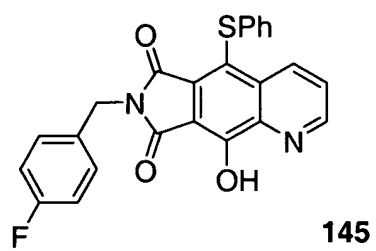
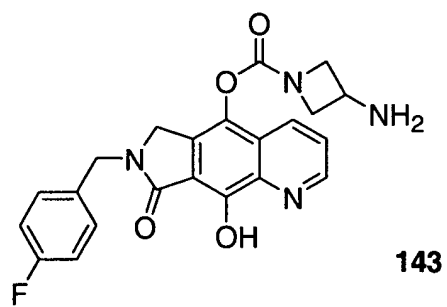


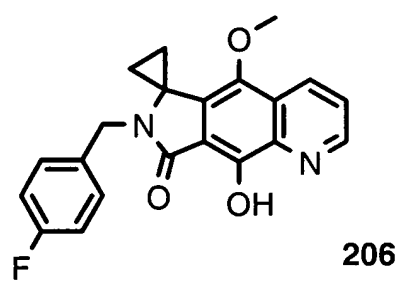
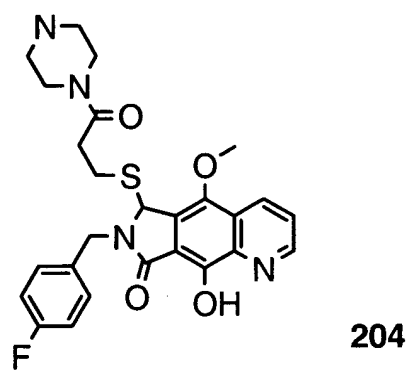
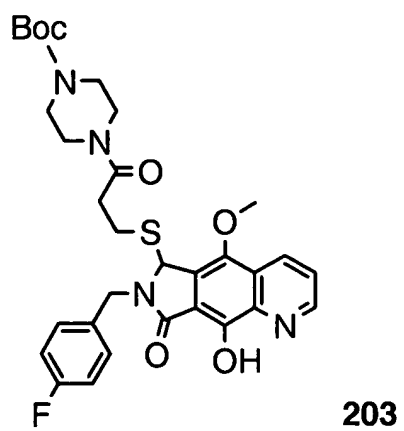


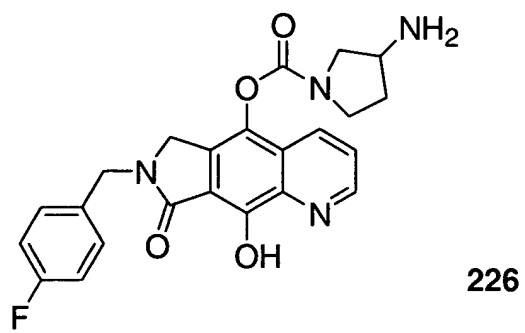
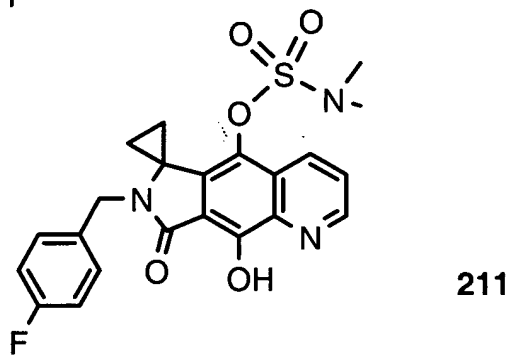
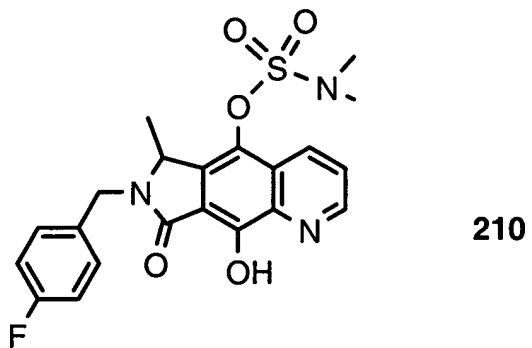
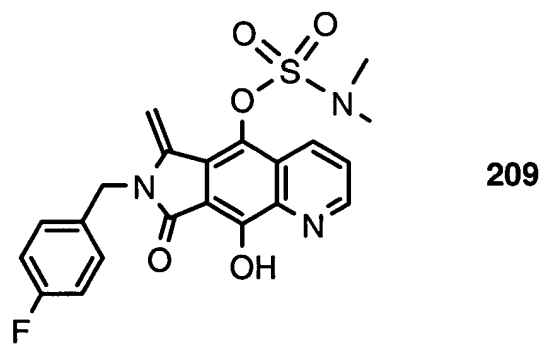


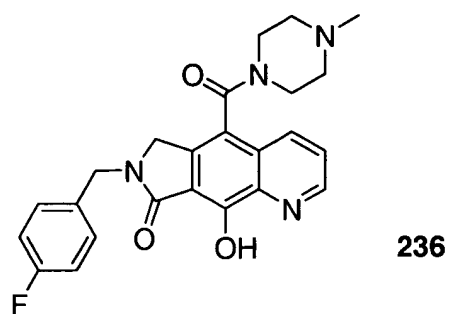
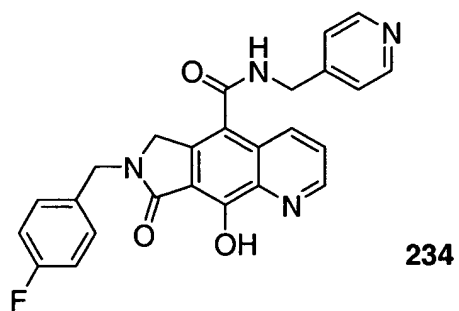
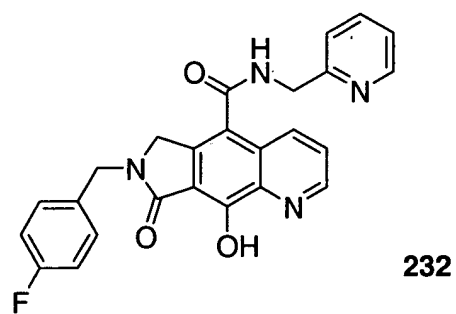
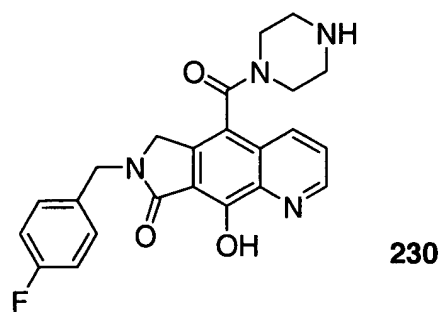
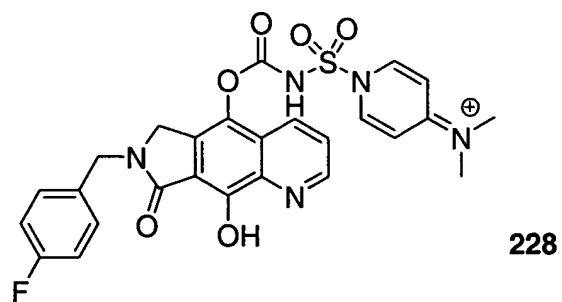


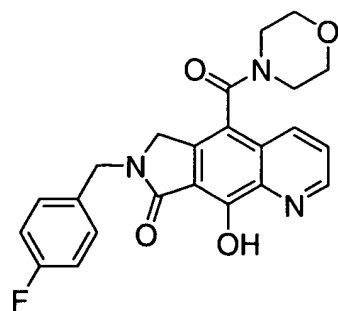




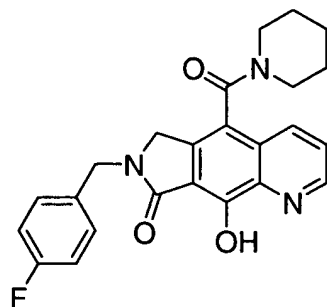




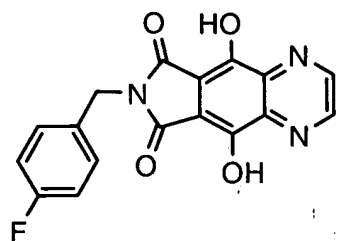




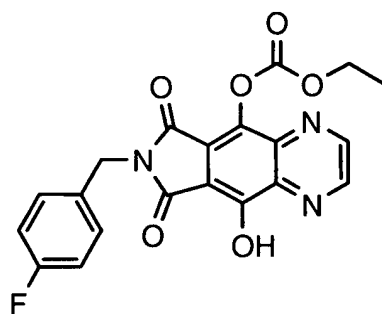
238



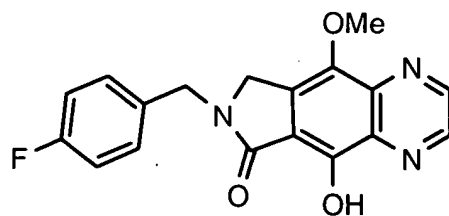
240



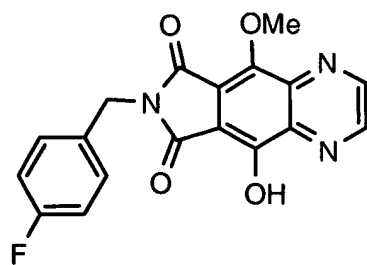
242



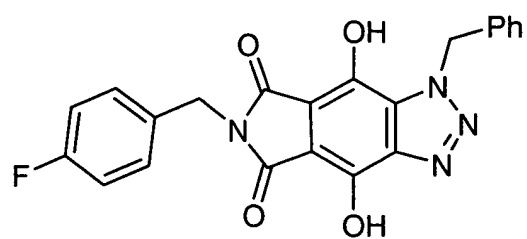
243



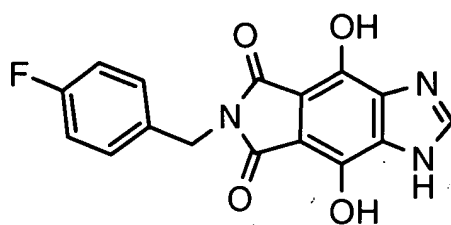
248



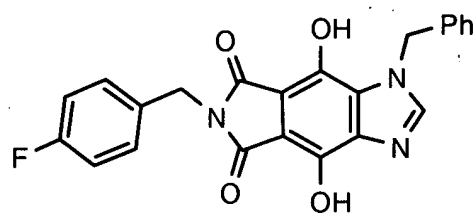
**249**



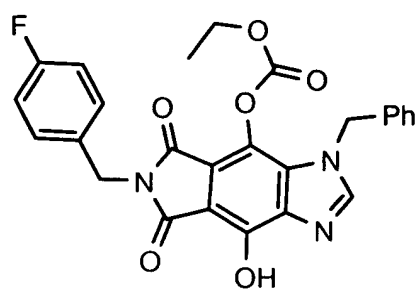
**251**



**253**

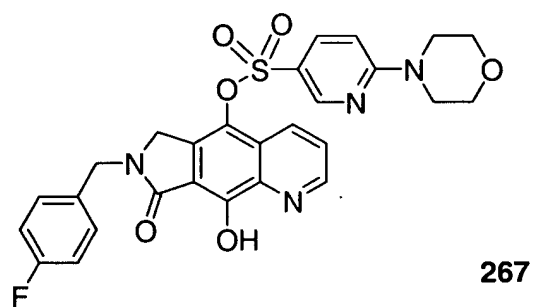
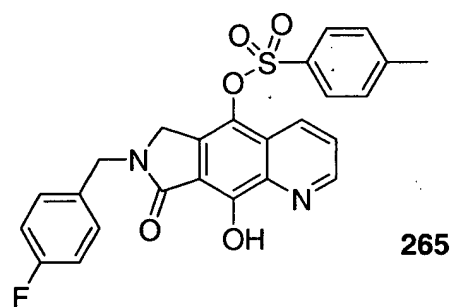
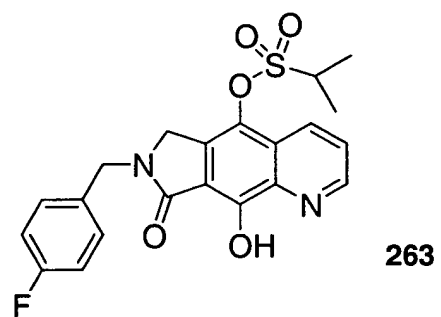
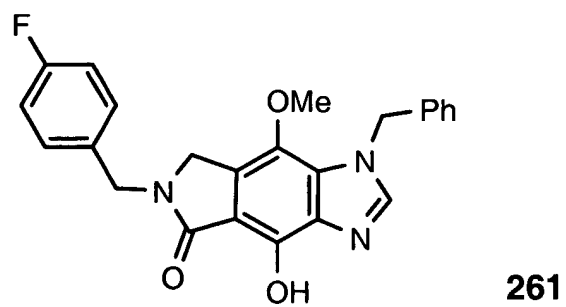


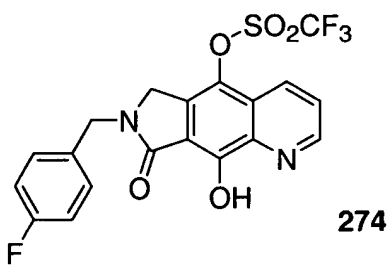
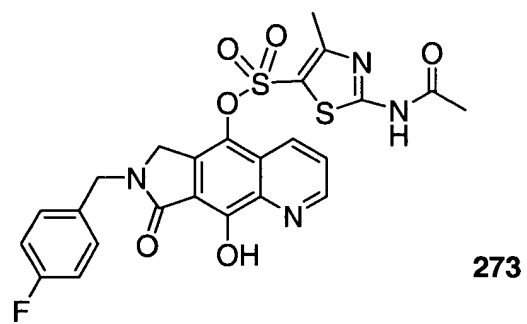
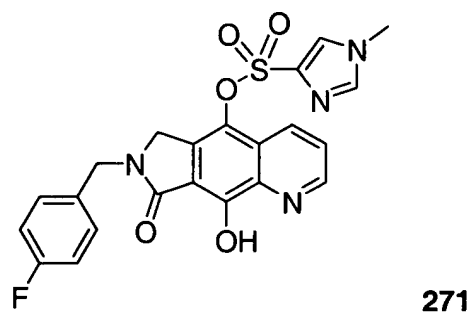
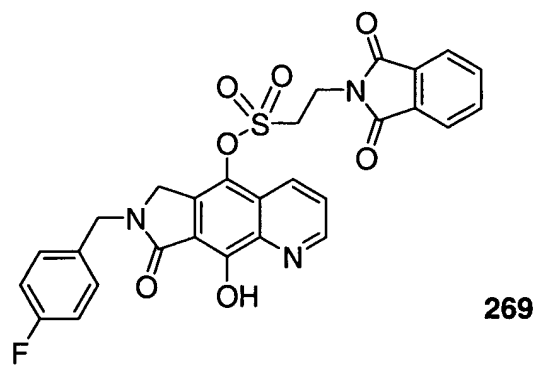
**255**

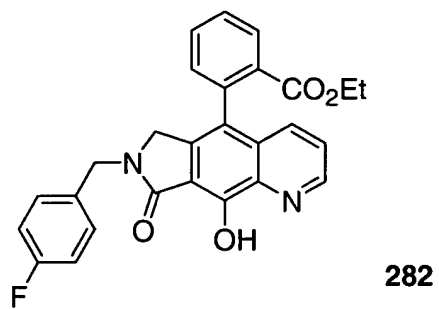
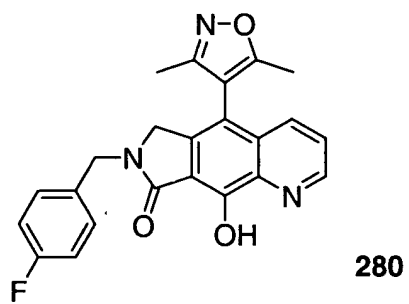
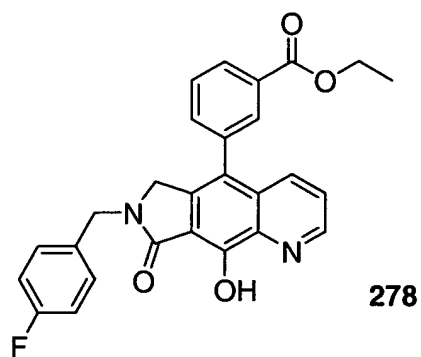
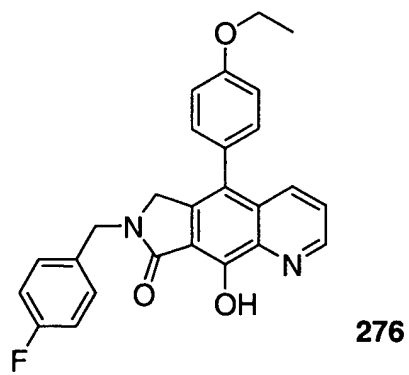


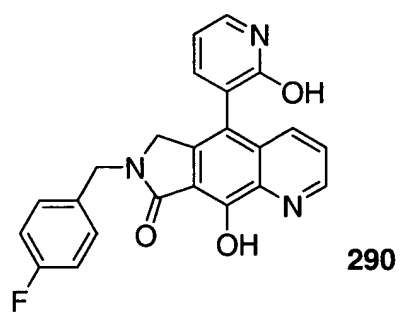
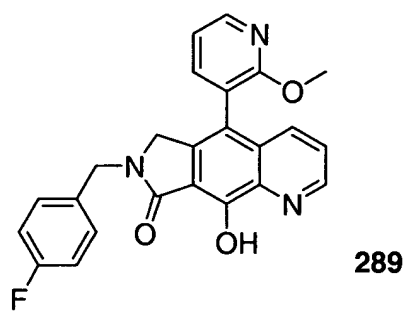
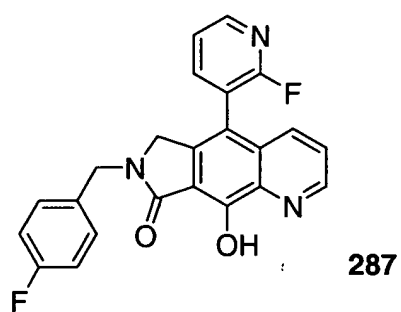
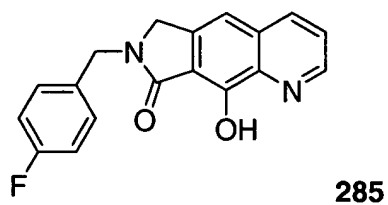
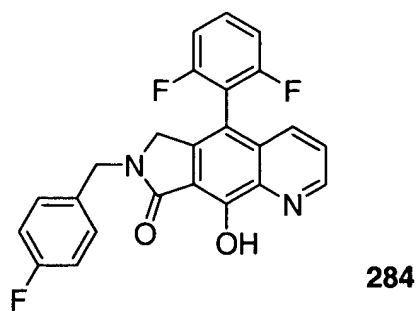
**256**

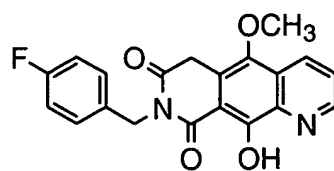




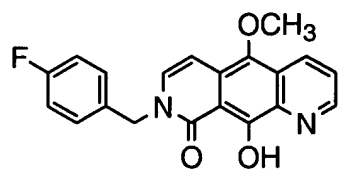




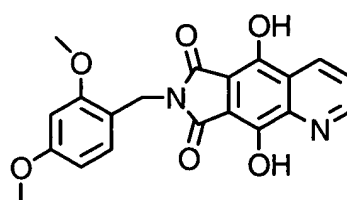




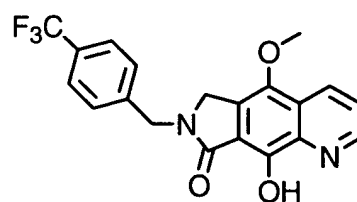
296



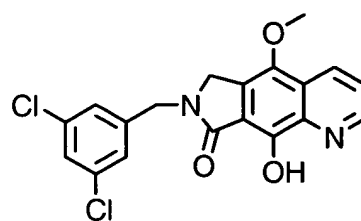
298



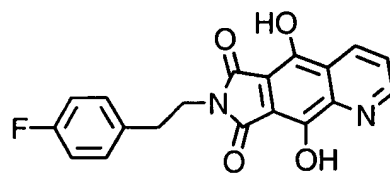
300



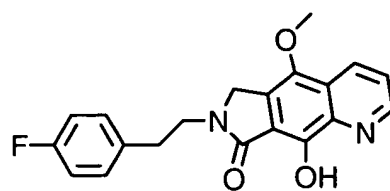
306



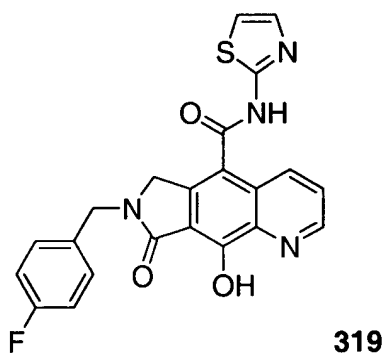
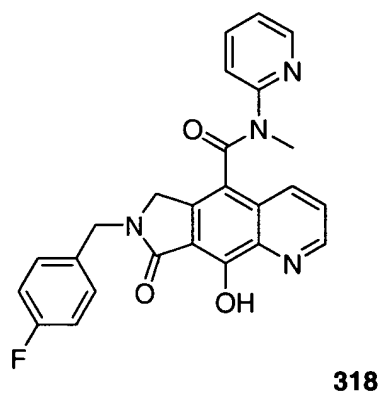
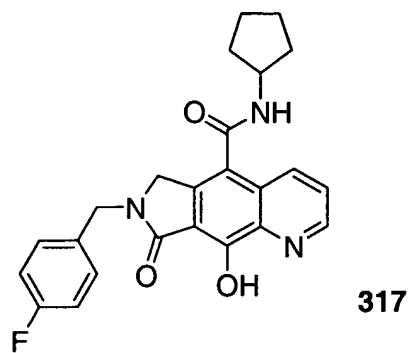
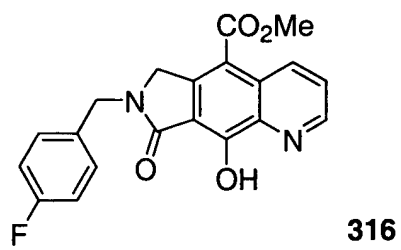
308

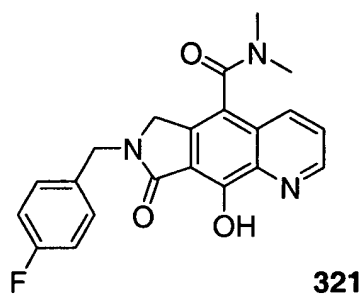
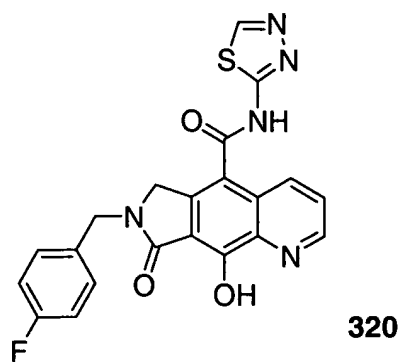


310

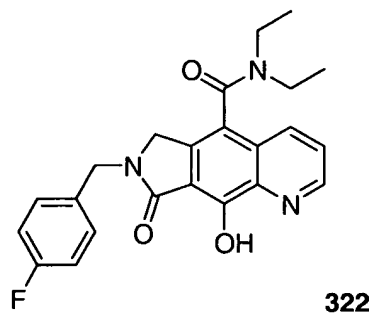


313

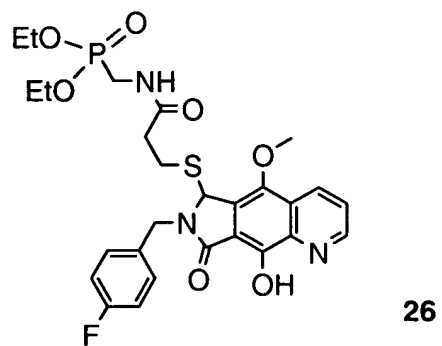


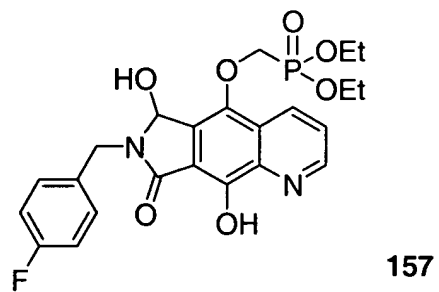
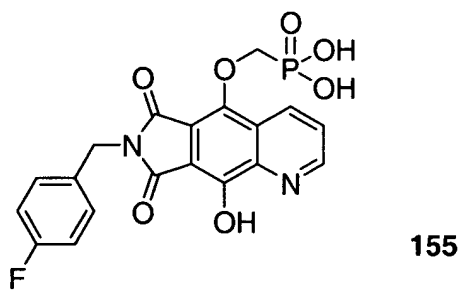
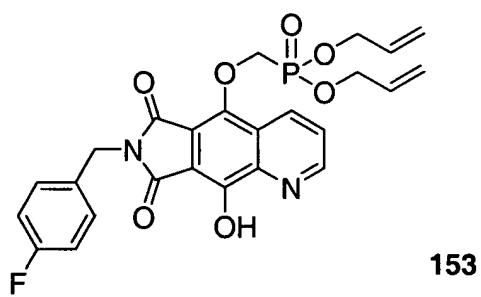
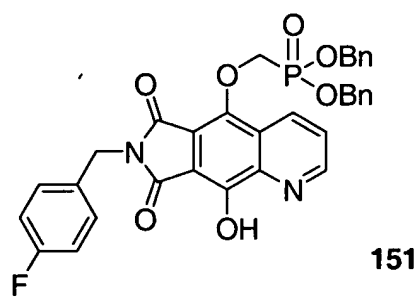
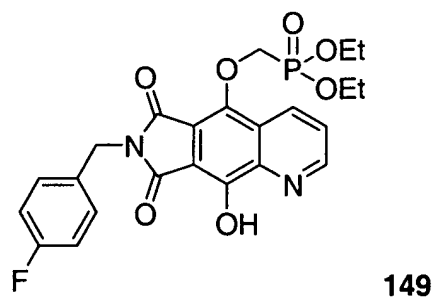


and

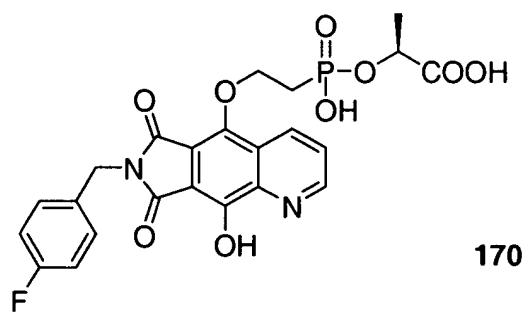
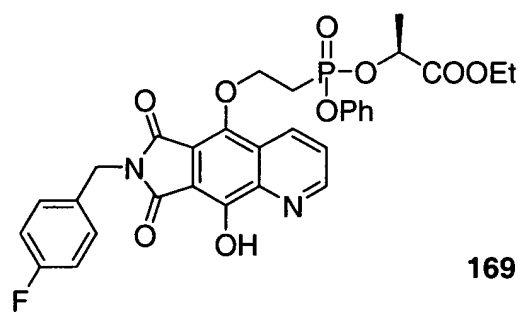
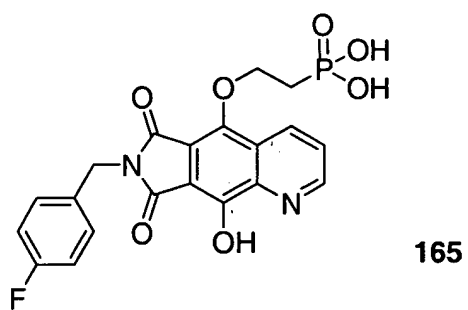
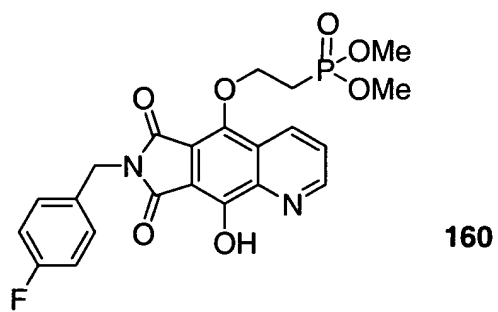
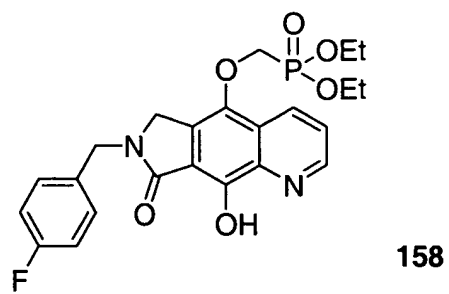


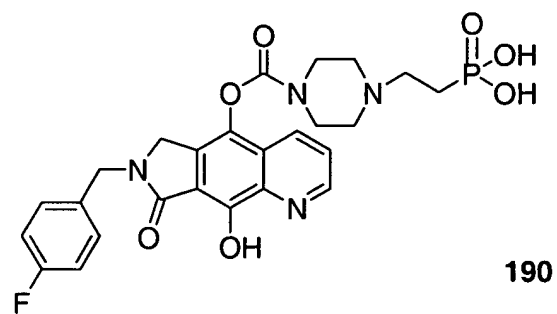
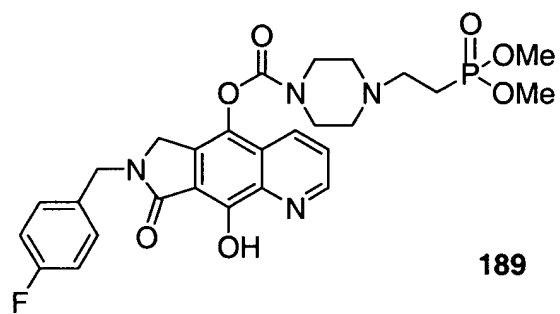
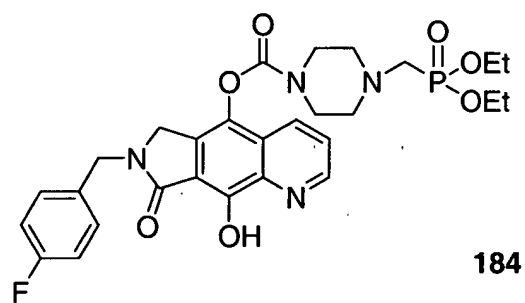
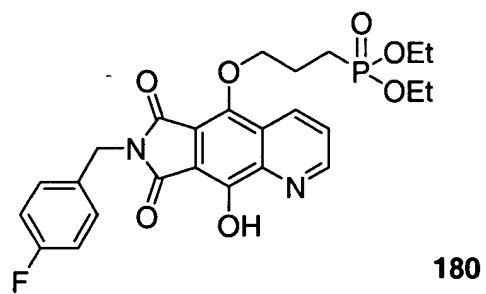
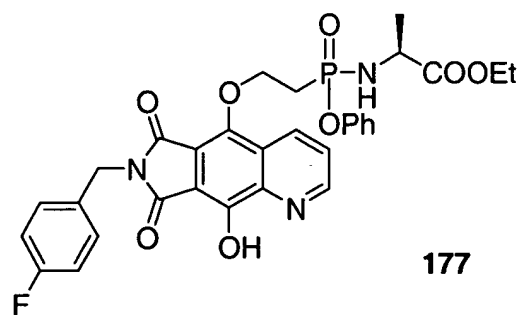
48. (previously presented): A compound of claim 13 selected from the structures:

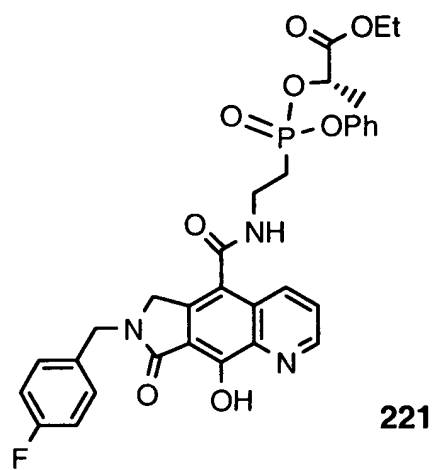
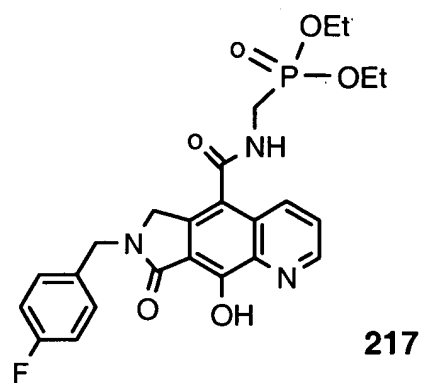
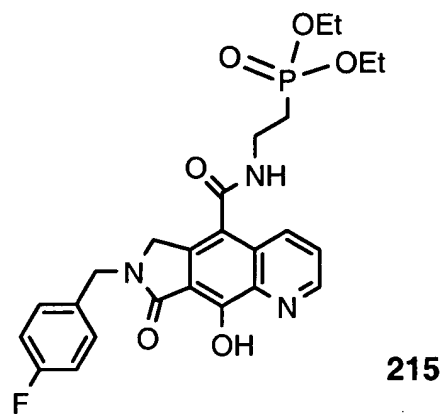
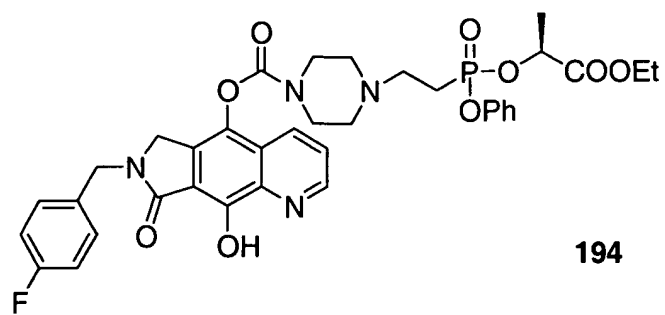


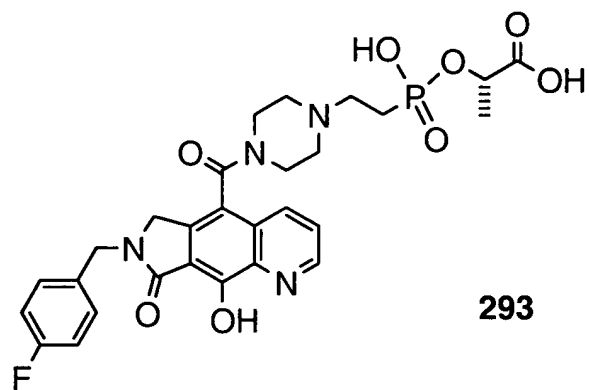
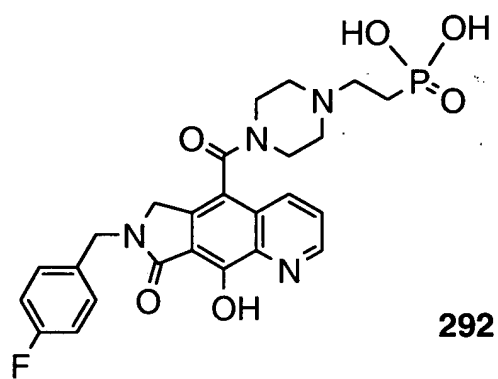
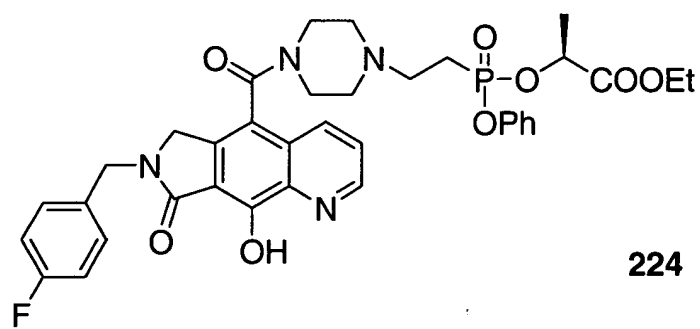
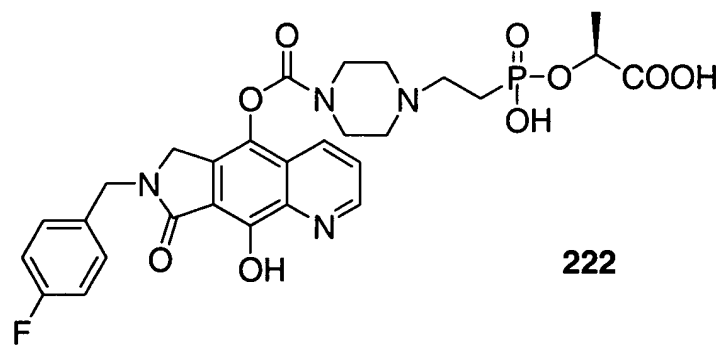


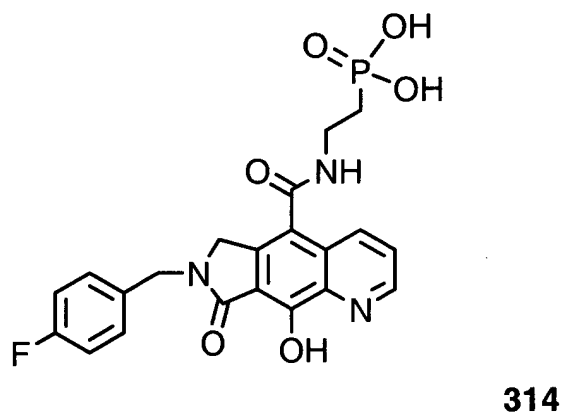
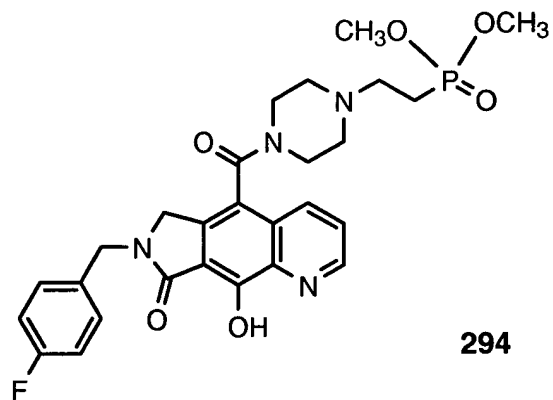




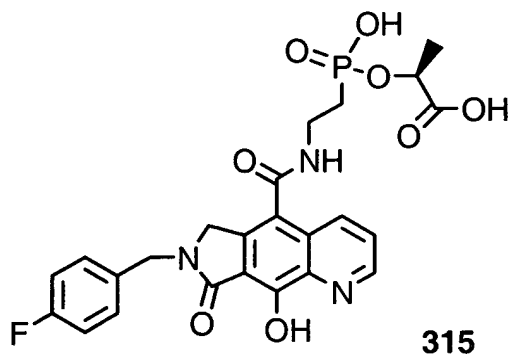




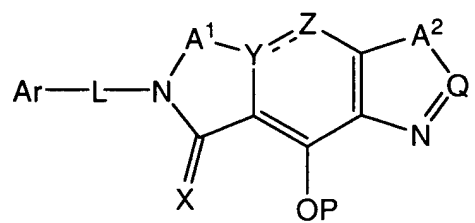




and



49. (previously presented): A compound having the structure:

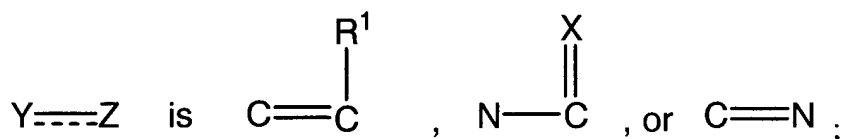


or a salt thereof;

wherein:

$A^1$  and  $A^2$  are independently selected from O, S, NR,  $C(R^2)_2$ ,  $CR^2OR$ ,  $CR^2OC(=O)R$ ,  $C(=O)$ ,  $C(=S)$ ,  $CR^2SR$ ,  $C(=NR)$ ,  $C(R^2)_2-C(R^3)_2$ ,  $C(R^2)=C(R^3)$ ,  $NR-C(R^3)_2$ ,  $N=C(R^3)$ ,  $N=N$ ,  $SO_2-NR$ ,  $C(=O)C(R^3)_2$ ,  $C(=O)NR$ ,  $C(R^2)_2-C(R^3)_2-C(R^3)_2$ ,  $C(R^2)=C(R^3)-C(R^3)_2$ ,  $C(R^2)C(=O)NR$ ,  $C(R^2)C(=S)NR$ ,  $C(R^2)=N-C(R^3)_2$ ,  $C(R^2)=N-NR$ , and  $N=C(R^3)-NR$ ;

Q is N,  $^+NR$ , or  $CR^4$ ;



L is selected from a bond, O, S, S-S, S(=O), S(=O)<sub>2</sub>, S(=O)<sub>2</sub>NR, NR, N-OR, C<sub>1</sub>-C<sub>12</sub> alkylene, C<sub>1</sub>-C<sub>12</sub> substituted alkylene, C<sub>2</sub>-C<sub>12</sub> alkenylene, C<sub>2</sub>-C<sub>12</sub> substituted alkenylene, C<sub>2</sub>-C<sub>12</sub> alkynylene, C<sub>2</sub>-C<sub>12</sub> substituted alkynylene, C(=O)NH, OC(=O)NH, NHC(=O)NH, C(=O), C(=O)NH(CH<sub>2</sub>)<sub>n</sub>, or (CH<sub>2</sub>CH<sub>2</sub>O)<sub>n</sub>, where n may be 1, 2, 3, 4, 5, or 6;

X is selected from O, S, NH, NR, N-OR, N-NR<sub>2</sub>, N-CR<sub>2</sub>OR and N-CR<sub>2</sub>NR<sub>2</sub>;

Ar is selected from C<sub>3</sub>-C<sub>12</sub> carbocycle, C<sub>3</sub>-C<sub>12</sub> substituted carbocycle, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>6</sub>-C<sub>20</sub> substituted aryl, C<sub>2</sub>-C<sub>20</sub> heteroaryl, and C<sub>2</sub>-C<sub>20</sub> substituted heteroaryl;

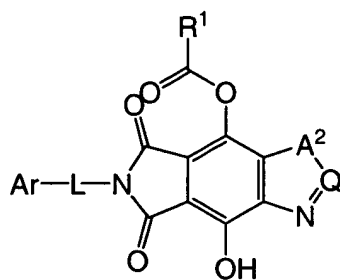
$R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  are each independently selected from H, F, Cl, Br, I, OH, -NH<sub>2</sub>, -NH<sub>3</sub><sup>+</sup>, -NHR, -NR<sub>2</sub>, -NR<sub>3</sub><sup>+</sup>, C<sub>1</sub>-C<sub>8</sub> alkylhalide, carboxylate, sulfate, sulfamate, sulfonate, 5-7 membered ring sultam, C<sub>1</sub>-C<sub>8</sub> alkylsulfonate, C<sub>1</sub>-C<sub>8</sub> alkylamino, 4-dialkylaminopyridinium, C<sub>1</sub>-C<sub>8</sub> alkylhydroxyl, C<sub>1</sub>-C<sub>8</sub> alkylthiol, -SO<sub>2</sub>R, -SO<sub>2</sub>Ar, -SOAr, -SAr, -SO<sub>2</sub>NR<sub>2</sub>, -SOR, -CO<sub>2</sub>R, -C(=O)NR<sub>2</sub>, 5-7 membered ring lactam, 5-7 membered ring lactone, -CN, -N<sub>3</sub>, -NO<sub>2</sub>, C<sub>1</sub>-C<sub>8</sub> alkoxy, C<sub>1</sub>-C<sub>8</sub> trifluoroalkyl, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> substituted alkyl, C<sub>3</sub>-C<sub>12</sub> carbocycle, C<sub>3</sub>-C<sub>12</sub> substituted carbocycle, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>6</sub>-C<sub>20</sub> substituted aryl, C<sub>2</sub>-C<sub>20</sub> heteroaryl, and C<sub>2</sub>-C<sub>20</sub> substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety;

when taken together on a single carbon, two  $R^2$  or two  $R^3$  may form a spiro ring;

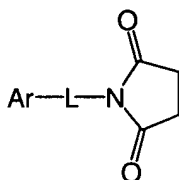
R is independently selected from H, C<sub>1</sub>–C<sub>8</sub> alkyl, C<sub>1</sub>–C<sub>8</sub> substituted alkyl, C<sub>6</sub>–C<sub>20</sub> aryl, C<sub>6</sub>–C<sub>20</sub> substituted aryl, C<sub>2</sub>–C<sub>20</sub> heteroaryl, and C<sub>2</sub>–C<sub>20</sub> substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug; and

P is a protecting group selected from benzyldryl (CHPh<sub>2</sub>), trialkylsilyl (R<sub>3</sub>Si), 2-trimethylsiloxyethyl, alkoxymethyl (CH<sub>2</sub>OR), and ester (C(=O)R).

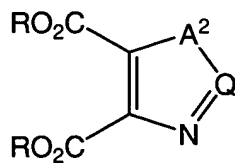
50. (previously presented): A process for preparation of a compound having the structure:



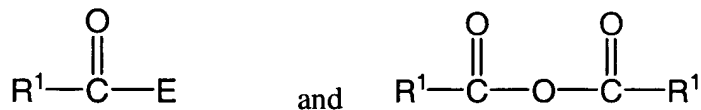
comprising reacting a succinimide compound having the structure:



with a heterocyclic compound having the structure:



and reaction with an acylation reagent comprising a formula selected from:



wherein:

A<sup>2</sup> is selected from O, S, NR, C(R<sup>2</sup>)<sub>2</sub>, CR<sup>2</sup>OR, CR<sup>2</sup>OC(=O)R, C(=O), C(=S), CR<sup>2</sup>SR, C(=NR), C(R<sup>2</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=C(R<sup>3</sup>), NR-C(R<sup>3</sup>)<sub>2</sub>, N=C(R<sup>3</sup>), N=N, SO<sub>2</sub>-NR, C(=O)C(R<sup>3</sup>)<sub>2</sub>, C(=O)NR, C(R<sup>2</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=C(R<sup>3</sup>)-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)C(=O)NR, C(R<sup>2</sup>)C(=S)NR, C(R<sup>2</sup>)=N-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=N-NR, and N=C(R<sup>3</sup>)-NR;

Q is N,  $^+NR$ , or  $CR^4$ ;

L is selected from a bond, O, S, NR, N-OR,  $C_1-C_{12}$  alkyldiyl,  $C_1-C_{12}$  substituted alkyldiyl,  $C(=O)NH$ ,  $C(=O)$ ,  $S(=O)$ ,  $S(=O)_2$ ,  $C(=O)NH(CH_2)_n$ , and  $(CH_2CH_2O)_n$ , where n ranges from 1 to 6;

Ar is selected from  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl, and  $C_2-C_{20}$  substituted heteroaryl;

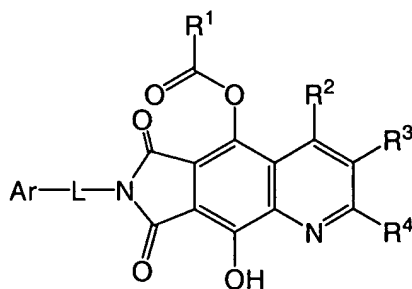
$R^1$  is selected from R, OR,  $NR_2$ ,  $NHR$ ,  $NHSO_2R$ , and  $NRSO_2R$ ;

E is selected from Cl, imidazole, and hydroxybenzotriazole;

$R^2$ ,  $R^3$  and  $R^4$  are each independently selected from H, F, Cl, Br, I, OH,  $-NH_2$ ,  $-NH_3^+$ ,  $-NHR$ ,  $-NR_2$ ,  $-NR_3^+$ ,  $C_1-C_8$  alkylhalide, carboxylate, sulfate, sulfamate, sulfonate, 5-7 membered ring sultam,  $C_1-C_8$  alkylsulfonate,  $C_1-C_8$  alkylamino, 4-dialkylaminopyridinium,  $C_1-C_8$  alkylhydroxyl,  $C_1-C_8$  alkylthiol,  $-SO_2R$ ,  $-SO_2Ar$ ,  $-SOAr$ ,  $-SAr$ ,  $-SO_2NR_2$ ,  $-SOR$ ,  $-CO_2R$ ,  $-C(=O)NR_2$ , 5-7 membered ring lactam, 5-7 membered ring lactone,  $-CN$ ,  $-N_3$ ,  $-NO_2$ ,  $C_1-C_8$  alkoxy,  $C_1-C_8$  trifluoroalkyl,  $C_1-C_8$  alkyl,  $C_1-C_8$  substituted alkyl,  $C_3-C_{12}$  carbocycle,  $C_3-C_{12}$  substituted carbocycle,  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl, and  $C_2-C_{20}$  substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety; and

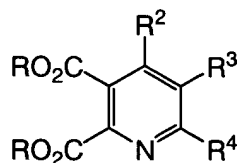
R is selected from  $C_1-C_6$  alkyl,  $C_1-C_6$  substituted alkyl,  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl,  $C_2-C_{20}$  substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety.

51. (previously presented): The process of claim 50 for preparation of a compound having the structure:

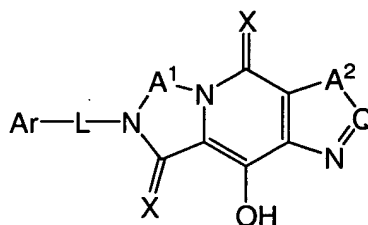


wherein the heterocyclic compound has the structure:

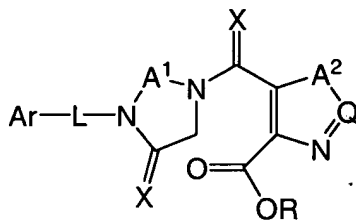




52. (previously presented): A process for preparation of a compound having the structure:



comprising reacting a compound having the structure:



with a basic reagent comprising hydroxide, an alkoxide or an amine;

wherein:

A<sup>1</sup> and A<sup>2</sup> are independently selected from O, S, NR, C(R<sup>2</sup>)<sub>2</sub>, CR<sup>2</sup>OR, CR<sup>2</sup>OC(=O)R, C(=O), C(=S), CR<sup>2</sup>SR, C(=NR), C(R<sup>2</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=C(R<sup>3</sup>), NR-C(R<sup>3</sup>)<sub>2</sub>, N=C(R<sup>3</sup>), N=N, SO<sub>2</sub>-NR, C(=O)C(R<sup>3</sup>)<sub>2</sub>, C(=O)NR, C(R<sup>2</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=C(R<sup>3</sup>)-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)C(=O)NR, C(R<sup>2</sup>)C(=S)NR, C(R<sup>2</sup>)=N-C(R<sup>3</sup>)<sub>2</sub>, C(R<sup>2</sup>)=N-NR, and N=C(R<sup>3</sup>)-NR;

Q is N, <sup>+</sup>NR, or CR<sup>4</sup>;

X is selected from O, S, NH, NR, N-OR, N-NR<sub>2</sub>, N-CR<sub>2</sub>OR and N-CR<sub>2</sub>NR<sub>2</sub>;

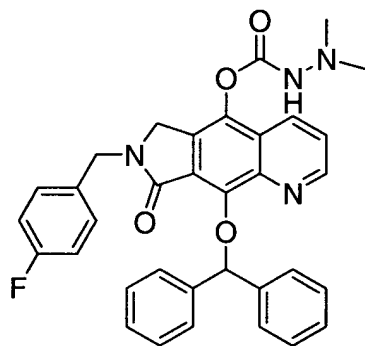
L is selected from a bond, O, S, NR, N-OR, C<sub>1</sub>-C<sub>12</sub> alkyldiyl, C<sub>1</sub>-C<sub>12</sub> substituted alkyldiyl, C(=O)NH, C(=O), S(=O), S(=O)<sub>2</sub>, C(=O)NH(CH<sub>2</sub>)<sub>n</sub>, and (CH<sub>2</sub>CH<sub>2</sub>O)<sub>n</sub>, where n ranges from 1 to 6;

Ar is selected from C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>6</sub>-C<sub>20</sub> substituted aryl, C<sub>2</sub>-C<sub>20</sub> heteroaryl, and C<sub>2</sub>-C<sub>20</sub> substituted heteroaryl;

$R^2$ ,  $R^3$  and  $R^4$  are each independently selected from H, F, Cl, Br, I, OH,  $-NH_2$ ,  $-NH_3^+$ ,  $-NHR$ ,  $-NR_2$ ,  $-NR_3^+$ ,  $C_1-C_8$  alkylhalide, carboxylate, sulfate, sulfamate, sulfonate, 5-7 membered ring sultam,  $C_1-C_8$  alkylsulfonate,  $C_1-C_8$  alkylamino, 4-dialkylaminopyridinium,  $C_1-C_8$  alkylhydroxyl,  $C_1-C_8$  alkylthiol,  $-SO_2R$ ,  $-SO_2Ar$ ,  $-SOAr$ ,  $-SAr$ ,  $-SO_2NR_2$ ,  $-SOR$ ,  $-CO_2R$ ,  $-C(=O)NR_2$ , 5-7 membered ring lactam, 5-7 membered ring lactone,  $-CN$ ,  $-N_3$ ,  $-NO_2$ ,  $C_1-C_8$  alkoxy,  $C_1-C_8$  trifluoroalkyl,  $C_1-C_8$  alkyl,  $C_1-C_8$  substituted alkyl,  $C_3-C_{12}$  carbocycle,  $C_3-C_{12}$  substituted carbocycle,  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl, and  $C_2-C_{20}$  substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety; and

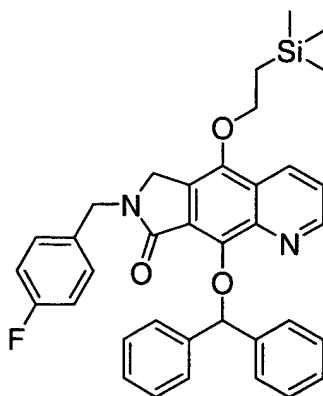
R is selected from  $C_1-C_6$  alkyl,  $C_1-C_6$  substituted alkyl,  $C_6-C_{20}$  aryl,  $C_6-C_{20}$  substituted aryl,  $C_2-C_{20}$  heteroaryl,  $C_2-C_{20}$  substituted heteroaryl, polyethyleneoxy, phosphonate, phosphate, and a prodrug moiety.

53. (previously presented): A process for preparation of a compound having structure 115:



**115**

comprising reacting a compound having the structure 44:



44

with tetrabutylammonium fluoride to form a desilylated intermediate; and reacting the desilylated intermediate with triphosgene (bis(trichloromethyl) carbonate), followed by dimethylhydrazine to form structure 115.

54. (previously presented): A compound of claim 1 comprising a phosphonate prodrug and capable of accumulating in human PBMC.

55. (previously presented): The compound of claim 54 wherein the bioavailability of the compound or an intracellular metabolite of the compound in human PBMC is improved when compared to the analog of the compound not having the phosphonate or phosphonate prodrug.

56. (previously presented): The compound of claim 54 wherein the intracellular half-life of the compound or an intracellular metabolite of the compound in human PBMC is improved when compared to the analog of the compound not having the phosphonate or phosphonate prodrug.

57. (previously presented): The compound of claim 56 wherein the half-life is improved by at least about 50%.

58. (previously presented): The compound of claim 56 wherein the half-life is improved by at least about 100%.

59. (previously presented): The compound of claim 54 wherein the intracellular half-life of a metabolite of the compound in human PBMC is improved when compared to an analog of the compound not having the phosphonate or phosphonate prodrug.

60. (previously presented): The compound of claim 59 wherein the half-life is improved by at least about 50%.

61. (previously presented): The compound of claim 59 wherein the half-life is improved by at least about 100%.

62. (previously presented): The compound of claim 59 wherein the half-life is improved by greater than 100%.

63. (previously presented): A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

64-67 (cancelled)

68. (previously presented): A process for making a pharmaceutical composition comprising combining a compound of claim 1 and a pharmaceutically acceptable carrier.

69-79 (cancelled)